

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

**Affiliated to Bharathidasan University
Nationally Accredited (3rd Cycle) with 'A' grade by NAAC
ISO 9001:2015 Certified
Annamalainagar
Tiruchirapalli-620018**



Minutes of the Ninth Meeting of the Academic Council

Date : 16.12.2023
Venue : Trust Meeting Hall

Time: 11.00 a.m.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
Affiliated to Bharathidasan University
Nationally Accredited (3rd Cycle) with 'A' grade by NAAC
ISO 9001:2015 Certified
Annamalainagar, Tiruchirapalli-620018

NINTH MEETING OF THE ACADEMIC COUNCIL

Date : 16.12.2023
Venue: Trust Meeting Hall

Time: 11.00 A.M.

MINUTES

WELCOME AND INTRODUCTORY REMARKS OF THE CHAIRMAN

The Chairman of the Academic Council Dr. V. Sujatha welcomed the gathering to the IX Meeting of the Academic Council

CONFIRMATION OF THE MINUTES OF THE LAST MEETING HELD ON 15.06.2023

The Member Secretary Dr. Sinthu Janita Prakash read the minutes of the VIII Meeting of the Academic Council comprising of 18 Resolutions- (Resolution 08/23/01 to Resolution 08/23/18) pertaining to the approval of the regulations for the Academic year (2022-2023) and onwards, III Semester Syllabus of all undergraduate and postgraduate programmes of (2022-2023) batch, III Semester Syllabus of all undergraduate and postgraduate programmes of (2022-2023) batch in accordance to TANSCHÉ, amendment in the curriculum in the previous semesters, introduction of new Value Added Courses and the declaration of the results of April 2023 examinations.

RESOLUTION NO.09/23/01

To consider and approve the syllabus of

- a. Part I Language - Tamil for Semester II of (2023-24) batch and Semester IV of (2022-2023) batch for all Under Graduate Programmes.
- b. Part III Core Course, Allied Course for Semester II of B.A Tamil for (2023 – 2024) batch and onwards.
- c. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.A Tamil for (2022- 2023) batch and onwards.
- d. Core Courses, Core Choice Course and Discipline Specific Elective Courses of Semester II of M.A Tamil for (2023-2024) batch and onwards.
- e. Core Courses, Core Choice Course, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.A Tamil for (2022-2023) batch and onwards.

*CCCD Director & Special Invitee **Dr Rajesh Kannan** suggested to shift the DSE-II Course Araichi Nerimuraigal (23PTA2DSE2A) of M.A Tamil from the second semester to the third semester which will be followed from the forthcoming (2024-2025) batch and onwards and approval was given for the syllabus of*

- a. *Part I Language - Tamil for Semester II of (2023-2024) batch and Semester IV of (2022-2023) batch for all Under Graduate Programmes.*
- b. *Part III Core Courses, Allied Course for Semester II of B.A Tamil for (2023- 2024) batch and onwards.*
- c. *Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.A Tamil for (2022- 2023) batch and onwards.*
- d. *Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.A Tamil for (2023-2024) batch and onwards.*
- e. *Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.A Tamil for (2022-2023) batch and onwards.*

*as recommended by the Board of Studies in Tamil and moved by the Chairman **Dr S Ramalakshmi** in the meeting and the same be approved as given in **Annexure A***

RESOLUTION NO.09/23/02

To consider and approve the syllabus of Part-I Other Language Sanskrit for Semesters II to IV for all Under Graduate Programmes of (2023-2024) batch and onwards

*Academic Expert **Dr. D.I George Amalrethinam** suggested to uniformly give five Course Outcomes for all the courses and it is resolved to approve the syllabus of Part-I Other Language Sanskrit for Semesters II to IV for all Under Graduate Programmes of (2023-2024) batch and onwards as moved by **Ms V Roopa** in the meeting and the same be approved as given in **Annexure B***

RESOLUTION NO.09/23/03

To consider and approve the syllabus of

- a. *Part II English Language - English for Semester II of (2023-24) batch and Semester IV of (2022-2023) batch for all Under Graduate Programmes.*
- b. *Part III Core Course, Allied Course for Semester II of B.A English for (2023- 2024) batch and onwards.*
- c. *Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.A English for (2022- 2023) batch and onwards.*
- d. *Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.A English for (2023-2024) batch and onwards.*
- e. *Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.A English for (2022-2023) batch and onwards.*

Considered and approved the syllabus of

- a. *Part II English Language - English for Semester II of (2023-24) batch and Semester IV of (2022-2023) batch for all Under Graduate Programmes.*

- b. *Part III Core Course, Allied Course for Semester II of B.A English for (2023– 2024) batch and onwards.*
- c. *Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.A English for (2022-2023) batch and onwards.*
- d. *Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.A English for (2023-2024) batch and onwards.*
- e. *Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.A English for (2022-2023) batch and onwards.*

*as recommended by the Board of Studies in English and moved by the UG Chairman **Dr S Jayashree Agarwal** & PG Chairman **Dr P Urmila** in the meeting and the same be approved as given in **Annexure C***

RESOLUTION NO.09/23/04

To consider and approve the syllabus of

- a. *Part III Core Course, Allied Course for Semester II of B.S.W for (2023– 2024) batch and onwards.*
- b. *Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of BSW for (2022-2023) batch and onwards.*
- c. *Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.S.W for (2023-2024) batch and onwards.*
- d. *Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.S.W for (2022-2023) batch and onwards.*

*CCCD Director & Special Invitee **Dr Rajesh Kannan** suggested to invite experts to handle sessions for courses like Disaster Management & Health and Family and is resolved to approve the syllabus of*

- a. *Part III Core Course, Allied Course for Semester II of B.S.W for (2023– 2024) batch and onwards.*
- b. *Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of BSW for (2022- 2023) batch and onwards.*
- c. *Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.S.W for (2023-2024) batch and onwards.*
- d. *Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.S.W for (2022-2023) batch and onwards.*

*as recommended by the Board of Studies in Social Work and moved by the Head of the Department **Dr G Mettilda Bhuvanewari** in the meeting and the same be approved as given in **Annexure D***

RESOLUTION NO.09/23/05

To consider and approve the Syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.B.A for (2023– 2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.B.A for (2022- 2023) batch and onwards.

CCCD Director & Special Invitee **Dr Rajesh Kannan** suggested the faculty from Social Work Department to handle the Stress Management Course. University Nominee **Dr P Muruganandham** suggested to remove the Wikipedia links from the reference section of the syllabus and is resolved to approve the Syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.B.A for (2023– 2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.B.A for (2022- 2023) batch and onwards.

as recommended by the Board of Studies in Business Administration and moved by the Chairman **Dr J Tamil Selvi** in the meeting and the same be approved as given in **Annexure E**

RESOLUTION NO.09/23/06

To consider and approve the Syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.Com & B.Com(CA) for (2023– 2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Com & B.Com(CA) for (2022- 2023) batch and onwards.
- c. Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Com for (2023-2024) batch and onwards.
- d. Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Com for (2022-2023) batch and onwards.

Considered and approved the syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.Com & B.Com(CA) for (2023– 2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Com & B.Com(CA) for (2022- 2023) batch and onwards.
- c. Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Com for (2023-2024) batch and onwards.

- d. Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Com for (2022-2023) batch and onwards.

as recommended by the Board of Studies in Commerce and moved by the Chairman **Dr N Savithri** in the meeting and the same be approved as given in **Annexure F**

RESOLUTION NO.09/23/07

To consider and approve the syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.Sc Mathematics for (2023– 2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Mathematics for (2022- 2023) batch and onwards.
- c. Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Mathematics for (2023-2024) batch and onwards.
- d. Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Mathematics for (2022-2023) batch and onwards.

University Nominee **Dr P Muruganandham** suggested make use of the licensed version of MATLAB and also informed that Axiom could be used instead of LATEX and it was resolved to approve the syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.Sc Mathematics for (2023–2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Mathematics for (2022- 2023) batch and onwards.
- c. Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Mathematics for (2023-2024) batch and onwards.
- d. Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Mathematics for (2022-2023) batch and onwards.

as recommended by the Board of Studies in Mathematics and moved by the Chairman **Dr S Premalatha** in the meeting and the same be approved as given in **Annexure G**

RESOLUTION NO.09/23/08

To consider and approve the syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.Sc Physics for (2023– 2024) batch and onwards.

- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Physics for (2022- 2023) batch and onwards.
- c. Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Physics for (2023-2024) batch and onwards.
- d. Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Physics for (2022-2023) batch and onwards.

Resolved to approve

- a. *Part III Core Course, Allied Course for Semester II of B.Sc Physics for (2023–2024) batch and onwards.*
- b. *Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Physics for (2022-2023) batch and onwards.*
- c. *Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Physics for (2023-2024) batch and onwards.*
- d. *Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Physics for (2022-2023) batch and onwards.*

*as moved by the Chairman **Dr G Maheswari** in the meeting and the same be approved as given in **Annexure H***

RESOLUTION NO.09/23/09

To consider and approve the syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.Sc Chemistry for (2023–2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Chemistry for (2022- 2023) batch and onwards.
- c. Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Chemistry for (2023-2024) batch and onwards.
- d. Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Chemistry for (2022-2023) batch and onwards.

Resolved to approve the syllabus of

- a. *Part III Core Course, Allied Course for Semester II of B.Sc Chemistry for (2023–2024) batch and onwards.*
- b. *Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Chemistry for (2022- 2023) batch and onwards.*

- c. *Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Chemistry for (2023-2024) batch and onwards.*
- d. *Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Chemistry for (2022-2023) batch and onwards.*

*as recommended by the Board of Studies in Chemistry and moved by the Chairman **Dr P. Pungayee @ Amirtham** in the meeting and the same be approved as given in **Annexure I***

RESOLUTION NO.09/23/10

To consider and approve the

- a. *Syllabus of Part III Core Course, Allied Course for Semester II of B.Sc Computer Science & B.Sc Computer Science with Cognitive Systems for (2023– 2024) batch and onwards.*
- b. *Syllabus of Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Computer Science for (2022- 2023) batch and onwards.*
- c. *Ratification of I Semester of B.Sc Computer Science with Cognitive Systems for (2023- 2024) batch in accordance with TANSCHÉ.*
- d. *Ratification of the III Semester Core Course - VI Infrastructure Management of B.Sc Computer Science with Cognitive Systems for (2022-2023) batch and onwards.*
- e. *Ratification of I Semester Syllabus of M.Sc Computer Science for (2023-24) batch in accordance with TANSCHÉ.*
- f. *Syllabus of Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Computer Science for (2023-2024) batch and onwards.*
- g. *Syllabus of Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Computer Science for (2022-2023) batch and onwards.*

Resolved to approve the

- a. *Syllabus of Part III Core Course, Allied Course for Semester II of B.Sc Computer Science & B.Sc Computer Science with Cognitive Systems for (2023– 2024) batch and onwards.*
- b. *Syllabus of Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV& V of B.Sc Computer Science for (2022- 2023) batch and onwards.*
- c. *Ratification of I Semester syllabus of B.Sc Computer Science with Cognitive Systems for (2023-24) batch in accordance with TANSCHÉ.*
- d. *Ratification of the III Semester Core Course- VI infrastructure Management of B.Sc Computer Science with Cognitive Systems for (2022-2023) batch and onwards.*
- e. *Ratification of I Semester of M.Sc Computer Science for (2023-24) batch in accordance with TANSCHÉ.*

- f. *Syllabus of Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Computer Science for (2023-2024) batch and onwards.*
- g. *Syllabus of Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Computer Science for (2022-2023) batch and onwards.*

*as recommended by the Board of Studies in Computer Science and moved by the Chairman **Dr Sinthu Janita Prakash** in the meeting and the same be approved as given in **Annexure J***

RESOLUTION NO.09/23/11

To consider and approve the Syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.C.A for (2023– 2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.C.A for (2022-2023) batch and onwards.

Resolved to approve the Syllabus of

- a. *Part III Core Course, Allied Course for Semester II of B.C.A for (2023– 2024) batch and onwards.*
- b. *Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.C.A for (2022- 2023) batch and onwards.*

*as recommended by the Board of Studies in Computer Applications and moved by the Chairman **Dr Merlin Packiam** in the meeting and the same be approved as given in **Annexure K**.*

RESOLUTION NO.09/23/12

To consider and approve the Syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.Sc Information Technology for (2023– 2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Information Technology for (2022- 2023) batch and onwards.

Resolved to approve the Syllabus of

- a. *Part III Core Course, Allied Course for Semester II of B.Sc Information Technology for (2023– 2024) batch and onwards.*
- b. *Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Information Technology for (2022- 2023) batch and onwards.*

*as recommended by the Board of Studies in Information Technology and moved by the Chairman **Dr M Parveen** in the meeting and the same be approved as given in **Annexure L***

RESOLUTION NO.09/23/13

To consider and approve the syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.Sc Microbiology for (2023– 2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Microbiology for (2022- 2023) batch and onwards.
- c. Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Microbiology for (2023-2024) batch and onwards.
- d. Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Microbiology for (2022-2023) batch and onwards.

Resolved to approve the syllabus of

- a. *Part III Core Course, Allied Course for Semester II of B.Sc Microbiology for (2023– 2024) batch and onwards.*
- b. *Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Microbiology for (2022- 2023) batch and onwards.*
- c. *Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Microbiology for (2023-2024) batch and onwards.*
- d. *Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Microbiology for (2022-2023) batch and onwards.*

*as recommended by the Board of Studies in Microbiology and moved by the Chairman **Dr B Thamilmaraiselvi** in the meeting and the same be approved as given in **Annexure M***

RESOLUTION NO.09/23/14

To consider and approve the Syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.Sc Biotechnology for (2023– 2024) batch and onwards.
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Biotechnology for (2022- 2023) batch and onwards.

Resolved to approve the Syllabus of

- a. Part III Core Course, Allied Course for Semester II of B.Sc Biotechnology for (2023–2024) batch and onwards.*
- b. Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Biotechnology for (2022- 2023) batch and onwards.*

*as recommended by the Board of Studies in Biotechnology and moved by the Chairman **Dr R Rameswari** in the meeting and the same be approved as given in **Annexure N***

RESOLUTION NO.09/23/15

To consider and approve the

- a. Syllabus of Part III Core Course, Allied Course for Semester II of B.Sc Nutrition & Dietetics for (2023-2024) batch and onwards.*
- b. Syllabus of Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV& V of B.Sc Nutrition & Dietetics for (2022- 2023) batch and onwards.*
- c. Ratification of the I Semester Syllabus of B.Sc Nutrition & dietetics (2023-2024) batch*
- d. Syllabus of Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Food Service Management & Dietetics for (2023-2024) batch and onwards.*
- d. Syllabus of Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Food Service Management & Dietetics for (2022-2023) batch and onwards.*

Considered and approved the

- a. Syllabus of Part III Core Course, Allied Course for Semester II of B.Sc Nutrition & Dietetics for (2023-2024) batch and onwards.*
- b. Syllabus of Part III Core Courses, Allied Courses, Discipline Specific Elective courses and Part IV Generic Elective Course, Skill Enhancement Course of Semester IV & V of B.Sc Nutrition & Dietetics for (2022- 2023) batch and onwards.*
- c. Ratification of the I Semester Syllabus of B.Sc Nutrition & Dietetics of (2023-2024) batch*
- d. Syllabus of Core Courses, Core Choice Courses and Discipline Specific Elective Courses of Semester II of M.Sc Food Service Management & Dietetics for (2023-2024) batch and onwards.*
- e. Syllabus of Core Courses, Core Choice Courses, Generic Elective and Discipline Specific Elective Courses for Semester IV of M.Sc Food Service Management & Dietetics for (2022-2023) batch and onwards.*

*as recommended by the Board of Studies in Food Service Management and Dietetics and moved by the Chairman **Dr B Thanuja** in the meeting and the same be approved as given in **Annexure O***

RESOLUTION NO.09/23/16

Matters relating to the Controller of Examinations

- a. Ratification of the Internal and External marks for the practical courses for (2023-2024) batch and onwards
- b. Conduct of End Semester Examinations and the Declaration of Result

Approval was given for

- a. *the ratification of the Internal marks as 40 and the external marks as 60 for all the practical courses of UG, PG programmes for (2023-2024) batch and onwards*
- b. *Conduct of End Semester Examinations and the Declaration of Result of November 2023*

*as given in **Annexure P***

Any other matter with the permission of the Chair

*Student representative **Ms K. Nikitha** of II MSc Food Science Management & Dietetics gave the suggestion to include some application oriented practical in the Compulsory Courses like Cyber Security and Innovation and Entrepreneurship, since the students of different streams are finding it difficult to study it as a theory course.*

*Student representative **Ms G. Harini** of III BBA suggested to include Case Studies and Role Play along with the ICT based teaching pedagogy to make learning more interesting for students*

-sd-

Dr V Sujatha

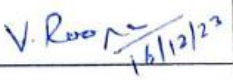
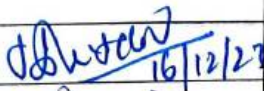
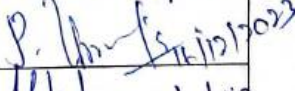
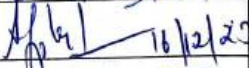
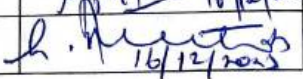
(Chairman of the Academic Council & The Principal)

CAUVERY COLLEGE FOR WOMEN (Autonomous)

Affiliated to Bharathidasan University
Accredited (3rd Cycle) with 'A' grade by NAAC
ISO 9001:2015 Certified
Tiruchirapalli-620018

THE MINUTES OF THE NINTH MEETING OF THE ACADEMIC COUNCIL

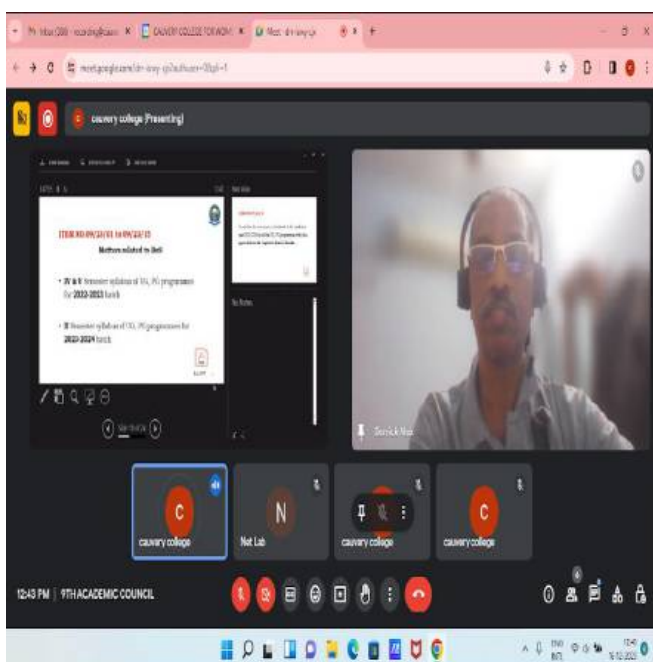
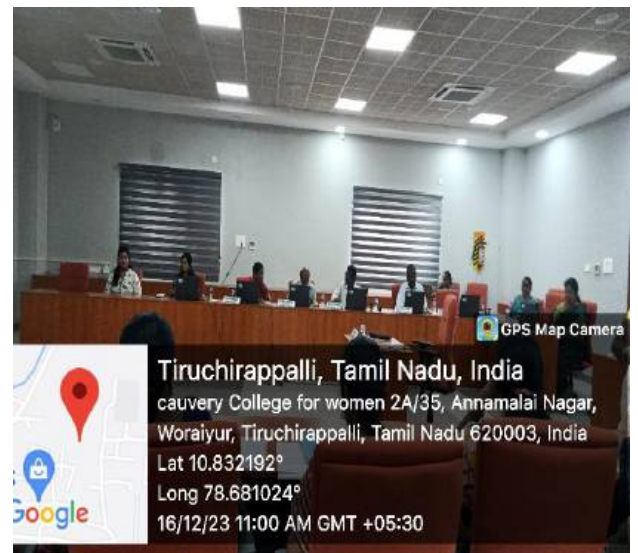
The ninth meeting of the Academic Council was held on 16th December 2023, Saturday at 11.00 a.m. in the Trust Meeting Hall under the Chairmanship of **Dr. V. Sujatha**, Principal. The following members were present.

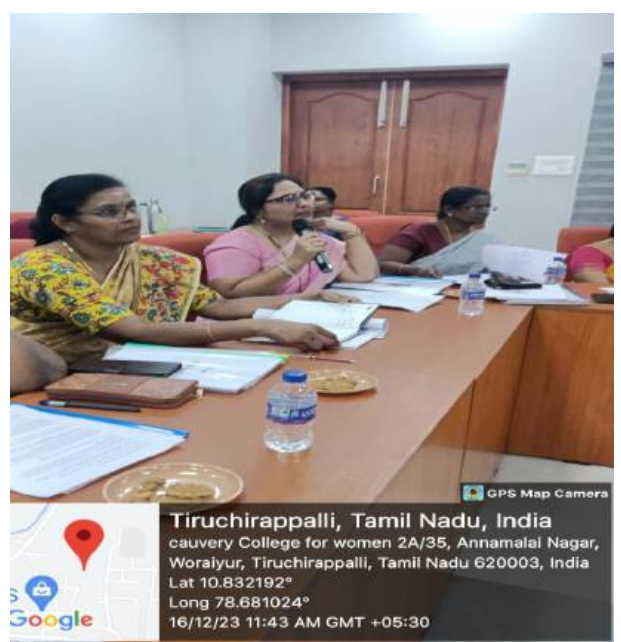
S.No	Members	Designation	Signature
Chairman			
1	Dr. V. Sujatha	Principal, Cauvery College for Women (A)	
University Nominees			
2	Dr. P. Muruganandam	Professor & Head, Dept. of Physics, Bharathidasan University, Trichy.	 16/12/2023
3	Dr. T. Sivasudha	Professor, Dept. of Environmental Biotechnology, Bharathidasan University, Trichy.	
Academic Experts			
4	Dr. D. I. George Amalarethinam	Vice Principal, Associate Professor & Head Dept. of Computer Science, Jamal Mohamed College (A), Trichy.	
Industry Expert			
5	Mr. Derrick Alex	AGM Operations, V Dart Technologies. Pvt. Ltd.	Attended Online
Special Invitees			
6	Dr V. Rajesh Kannan	Director Council for College & Curriculum Development Bharathidasan University, Trichy	
7	Ms. Roopa	Sanskrit(Guest Lecturer)	 16/12/23
Internal Members			
Heads of the Departments			
8	Dr. S. Ramalakshmi	Vice Principal & HoD of Tamil	 16/12/23
9	Dr. P. Urmila	HoD of English (PG)	 16/12/2023
10	Dr. S. Jayashree Agarwal	HoD of English (UG)	 16/12/23
11	Dr. S. Metilda Buvaneswari	HoD of Social Work	 16/12/2023

12	Dr. J. Tamil Selvi	HoD of BBA	<i>J. Tamil Selvi</i> 16/12/23
13	Dr. N. Savithri	Dean of Arts & HoD of Commerce	<i>N. Savithri</i> 16/12/23
14	Dr. S. Premalatha	HoD of Mathematics	<i>S. Premalatha</i> 16/12/23
15	Dr. G. Maheswari	HoD of Physics	<i>G. Maheswari</i> 16/12/23
16	Dr. P. Pungayee @ Amirtham	HoD of Chemistry	<i>P. Pungayee</i> 16/12/23
17	Dr. R. Merlin Packiam	HoD of Computer Applications	<i>R. Merlin Packiam</i> 16/12/23
18	Dr. M. Parveen	HoD of Information Technology	<i>M. Parveen</i> 16/12/23
19	Dr. B. Tamilmaraiselvi	HoD of Microbiology	<i>B. Tamilmaraiselvi</i> 16/12/23
20	Dr. R. Rameshwari	HoD of Biotechnology	<i>R. Rameshwari</i> 16/12/23
21	Dr. B. Thanuja	HoD of Food Service Management & Dietetics	<i>B. Thanuja</i> 16/12/23
Senior Faculty in the College by Rotation			
22	Dr. S. Shameem	Vice Principal	<i>S. Shameem</i> 16/12/23
23	Dr. G. Kanaga	Dean of Alumni Relations	<i>G. Kanaga</i> 16/12/23
24	Dr. V. Ramya	Controller of Examinations	<i>V. Ramya</i> 16/12/23
25	Dr. N. Sivapriya	Deputy Controller of Examinations	<i>N. Sivapriya</i> 16/12/23
26	Dr. B Baby Shakila	Director of Physical Education	<i>B. Baby Shakila</i> 16/12/23
27	Ms. N. Girubagari	Head in Charge, Computer Science	<i>N. Girubagari</i> 16/12/23
28	Dr. H. Krishnaveni	Course Coordinator, B.Sc Computer Science with Cognitive Systems	<i>H. Krishnaveni</i> 16/12/23
Student Representatives			
29	Ms. K. Nikitha	II M.Sc FSM & D	<i>K. Nikitha</i> 16/12/23
30	Ms. G. Harini	III BBA	<i>G. Harini</i> 16/12/23
Member Secretary			
31	Dr. V. Sinthu Janita Prakash	Dean of Science, IQAC Coordinator, HoD of Computer Science	<i>V. Sinthu Janita Prakash</i> 16/12/23

THE FOLLOWING MEMBERS HAD EXPRESSED THEIR INABILITY TO ATTEND THE MEETING DUE TO THEIR PRE-OCCUPATION.

S.No	Members	Designation
1	Dr. R. Kalidasan	Professor & Head, Dept. of Physical Education & Yoga, Bharathidasan University, Trichy.
2	Dr. K. Karunakaran	Chief Executive Officer, Hindustan Educational Institutions, Coimbatore.
3	Dr. S. Senthilnathan	Director (FAC), UGC-HRDC, Department of Educational Technology, Bharathidasan University, Trichy.









ANNEXURE A

காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

தேசியத்தர நிர்ணயக்குழுவால் 'A' தகுதி பெற்றது

திருச்சிராப்பள்ளி – 18

தமிழாய்வுத்துறை

தன்னாட்சிப் பாடத்திட்டம்



2023 – 2024

இளங்கலைத் தமிழிலக்கியம்

இரண்டாம் பருவம்



Cauvery College for Women (Autonomous), Trichy-18

PG & Research Department of Tamil
B.A TAMIL

LEARNING OUTCOME BASED CURRICULAM FRAME WORK (CBCS -LOCF)

(For the Candidates admitted from the Academic year 2023-2024 onwards)

II SEMESTER

Semester	PART	Course	Course Title	Course Code	Inst. Hrs. /	Credits	Exam			Total
								Int MARKS	Ext MARKS	
II	I	Language Course-II(LC)	பொதுத்தமிழ் - II PothuThamizh -II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar -Ii	22ULH2						
			Basic French- II	22ULF2						
			Prose, Grammar and History of Sanskrit literature	23ULS2						
	II	English Language Course-II(ELC)	GENERAL ENGLISH -II	23UE2	6	3	3	25	75	100
	III	Core Course – III(CC)	நன்னூல் – எழுத்ததிகாரம் (காண்டிகையுரை) (Nannool Ezhuthathigaram-kaandigai urai)	23UTA2CC3	6	5	3	25	75	100
		Core Course-IV(CC)	இலக்கியத் திறனாய்வு (Ilakkiya Thiranaaivu)	23UTA2CC4	5	5	3	25	75	100
		First Allied Course – II (AC)	தமிழர் நுண்கலைகள் (Thamizhar Nunkalaigal)	23UTA2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
	Total				30	21	-	-	-	600

பாடத்திட்டம் – SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	பன்னிரு திருமுறைகள் 1. திருஞானசம்பந்தர் : திருவாவடுதுறை பதிகம் 2. திருநாவுக்கரசர் : விடம் தீர்த்த பதிகம் 3. சுந்தரர்- ஏழாம் திருமுறை பித்தா பிறைசூடி எனத் தொடங்கும் பாடல்முதல் 10 பாடல்கள் 4. மாணிக்கவாசகர் : திருவாசகம் திருச்சாழல் 5. இலக்கிய வரலாறு : சைவம்	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	நாலாயிரத் திவ்யப் பிரபந்தம் 1. பெரியாழ்வார் திருமொழி : நான்காம் பத்து - ஒன்பதாம் திருமொழி - திருவரங்கச் சிறப்பு 2. நாச்சியார் திருமொழி : இரண்டாம் திருமொழி 3. குலசேகர ஆழ்வார் : எட்டாம் திருமொழி 4. நம்மாழ்வார் : திருவாய்மொழி - எட்டாம் திருவாய்மொழி 5. இலக்கிய வரலாறு : வைணவம்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	சிறுநிலக்கியம் 1. தமிழ் விடு தூது - தமிழின் சிறப்பு 17 முதல் 27 வரை 2. அபிராமி அந்தாதி - அன்னையிடம் வேண்டல் 21 முதல் 25 வரை 3. குற்றாலக் குறவஞ்சி - குறத்தி நாட்டுவளம் கூறுதல் : அ) சூர மாங்குயிற் சின்னங்கள் ஆ) நீங்கக் காண்பது இ) ஓடக் காண்பது 4. முக்கூடற்பள்ளு - வித்து வகை 5. தனிப்பாடல்கள் - 1. காளமேகப் புலவர் அ) சங்கரற்கு ஆ) நீர்நிலைகளில் 2. இராமச்சந்திரக் கவிராயர்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

	அ) கல்லைத்தான் மண்ணைத்தான் 3. அவ்வையார் அ) கொடியது கேட்கின் ஆ) அரியது கேட்கின் 6.இலக்கிய வரலாறு : சிற்றிலக்கியம்			
IV	புதினம், இலக்கிய வரலாறு 1. புதினம் - வாடி வாசல் – சி. சு. செல்லப்பா 2. இலக்கிய வரலாறு : புதினம்	20	CO1 CO2 CO3 CO4	K1 K2 K3 K4
V	மொழிப்பயிற்சி 1. வலி மிகுதலும் மிகாமையும் 2. எழுத்து மாற்றத்தால் ஏற்படும் பொருள் மாற்றம் 3. கடிதம் எழுதுதல்	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	மனப்பாடப் பகுதி (சுய கற்றல்) இப்பகுதி இறுதி பருவத்தேர்விற்கு உரியதல்ல 1. திருவாசகம் - திருச்சதகம், மெய்யுணர்தல் 2. திருப்பாவை (முதல் 10 பாடல்கள்) 3. மீனாட்சியம்மைப் பிள்ளைத்தமிழ் - வருகைப் பருவம்(61வது பாடல்)	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

பாட நூல்கள் :

- செய்யுள் திரட்டு (2022), தமிழாய்வுத்தறை, காவேரி மகளிர் கல்லூரி (தன்னாட்சி), DD Print Media, Trichy – 18
- சி. சு. செல்லப்பா (2014), வாடிவாசல், காலச்சுவடு பதிப்பகம், சென்னை.
- தமிழ் இலக்கிய வரலாறு (2019), தமிழாய்வுத்தறை, காவேரி மகளிர் கல்லூரி (தன்னாட்சி), தமிழ்ப் பதிப்பகம், திருச்சிராப்பள்ளி – 18

இணைய தள முகவரிகள் :

- https://www.temple.org/templates/jd_boston/downloads/thiruvagasam_mutrothal_tamil.pdf
- https://ta.wikipedia.org/wiki/%E0%AE%A8%E0%AE%BE%E0%AE%B2%E0%AE%BE%E0%AE%AF%E0%AE%BF%E0%AE%B0_%E0%AE%A4%E0%AE%BF%E0%AE%B5%E0%AF%8D%E0%AE%B5%E0%AE%BF%E0%AE%AF%E0%AE%AA%E0%AF%8D_%E0%AE%AA%E0%AE%BF%E0%AE%B0%E0%AE%AA%E0%AE%A8%E0%AF%8D%E0%AE%A4%E0%AE%AE%E0%AF%8D
- <https://www.msuniv.ac.in/Download/Pdf/283a6d3d5d9e464>

கற்பித்தல் முறைகள்

குழக் கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, விவாதம்

பாடத்திட்ட வடிவமைப்பாளர்

முனைவர் பா. கவிதா

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	நன்னூல் – அறிமுகம், சிறப்புப் பாயிரம், பாயிரவியல்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	எழுத்தியல்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	பதவியல்	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	உயிரீற்றுப் புணரியல்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	மெய்யீற்றுப் புணரியல் உருபு புணரியல்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல நன்னூல் எழுத்ததிகாரக் கட்டமைப்பு	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

பாட நூல் :

* ஆறுமுக நாவலர் (ப.ஆ.), (1966), நன்னூல் காண்டிகை உரை, ஆறுமுகநாவலர் வி.அச்சகம், 300, தங்கசாலைத் தெரு, சென்னை.

* சோம.இளவரசு, (2003), இலக்கண வரலாறு (ப.127- 133), மெய்யப்பன் பதிப்பகம், சிதம்பரம்

பார்வை நூல்கள் :

* சங்கர நமச்சிவாயப் புலவர் (உ.ஆ.), (1968), நன்னூல் விருத்தியுரை, கழக வெளியீடு, சென்னை.

* சண்முகம், செ.வை., (2012), எழுத்திலக்கணக் கோட்பாடு, உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை.

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடிவினா, திட்டக்கட்டுரை, கரும்பலகை, குழு விவாதம்

Web Resources

<https://www.tamilvu.org/ta/library-I0900-html-I0900kan-118186>

Semester II	Internal Mark: 25	External Mark: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
23UTA2CC4	இலக்கியத் திறனாய்வு	CC	5	5

நோக்கம்

1. பல்வேறு இலக்கியங்களைத் திறனாய்வு செய்யும் ஆற்றலை வளரச் செய்தல்
2. இலக்கியக் கோட்பாடுகள் பற்றி அறியச் செய்தல்.
3. கவிதை, சிறுகதை, புதினம் போன்ற இலக்கியங்களின் உத்திகளை உணரச் செய்தல்.

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Knowledge Level
CO1	இலக்கியங்களின் வழி சமூகச்சூழலைப் புரிந்து கொள்ளுதல்	K1
CO2	இலக்கியங்களில் இடம்பெறும் வாழ்வியல் கோட்பாடுகளை மதிப்பிடுதல்.	K2
CO3	கவிதை, சிறுகதை, புதினம் போன்ற இலக்கியங்களைப் புனையும் பயிற்சிகளைப் பெறுதல்.	K3
CO4	இலக்கியங்களைத் திறனாய்வு செய்து பகுத்தறியும் திறன் பெறுதல்.	K2
CO5	சமூக மாற்றத்திற்கேற்ப இலக்கியங்களின் அடிப்படைக் கூறுகளை ஆராயும் ஆற்றல் பெறுதல்.	K3

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	2	3	3	2	3	3	2	3	2
CO4	3	1	3	3	2	3	3	3	3	3
CO5	3	1	2	3	3	3	3	3	3	3

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	இலக்கிய ஆய்வு – திறனாய்வு விளக்கம் – திறனாய்வின் பணி- திறனாய்வின் இலக்கியப் பண்புகள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	இலக்கிய மதிப்பீடு – இலக்கியத்தின் பணி – இலக்கியத்தின் பயன் – இலக்கியக் கலை – இலக்கிய உணர்ச்சிகள் – இலக்கிய வடிவம், கற்பனை- கலை கலைக்காகவே	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	கவிதை தோற்றம் வளர்ச்சி - கவிதை விளக்கம் – கவிதை உருவாகும் நெறி – உணர்ச்சி மொழி – கவிதை மொழி – கவிதையும் வாழ்க்கையும் – படிமங்கள் – தன்னுணர்ச்சிப் பாடல்கள்- கட்டுரை.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	சிறுகதை, நாடகம் - தோற்றம் வளர்ச்சி – கதைப்பின்னல் – பாத்திரப்படைப்பு.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	இலக்கிய இயக்கங்கள் – இயற்கையியல் – குறியீட்டியல் – நடப்பியல் – படிமவியல் – முருகியல்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	சுய கற்றல்) இப்பகுதி பருவத்தோர்விற்கு உரியதல்ல ஏதேனுமொரு கவிதை நூலைத் திறனாய்வு செய்தல்.			

பாட நூல்

1. தா. ஏ. ஞானமூர்த்தி, (2006), இலக்கியத் திறனாய்வியல், ஐந்திணைப் பதிப்பகம், 279, பாரதி சாலை, திருவல்லிக்கேணி, சென்னை – 600 005.

பார்வை நூல்கள்:

1. கோ. தேவராசன், (2005), – தமிழ் இலக்கியத் திறனாய்வுகள், மீனா கோபால் பதிப்பகம், குடியிருப்பு, ஆதம்பாக்கம் , சென்னை.
2. சு. பாலச்சந்திரன், (2017), இலக்கியத் திறனாய்வு, நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட் . – 41 – பி , சிட்கோ இண்டஸ்டிரியல் எஸ்டேட், அம்பத்தூர், சென்னை – 600 098.
3. அரங்க சுப்பையா, (1996), – இலக்கியத் திறனாய்வு இசங்களும் கொள்கைகளும், நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட், 41 – பி , சிட்கோ இண்டஸ்டிரியல் எஸ்டேட், அம்பத்தூர், சென்னை.

இணையதள முகவரி

<https://www.tamilvu.org/ta/courses-degree-d061-d0611-html-d0611100-22942>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்
பாடத்திட்ட வடிவமைப்பாளர் : முனைவர் மு. ஜெயலெட்சுமி

Semester II	Internal Marks : 25	External Mark 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
23UTA2AC2	தமிழர் நுண்கலைகள்	AC	5	3

நோக்கம் :

- கலைகளின் தோற்றம் வளர்ச்சி குறித்து அறிதல்
- இசை, ஆடற், சிற்பக் கலைகள் பற்றிய அறிவைப் பெறுதல்
- நாடகத் துறையின் வளர்ச்சி மற்றும் இன்றைய நிலையைப் பற்றியும் அறிதல்

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive Level
CO1	கலைகளின் வாயிலாக அக்காலச் சமூகச் சூழலைக் கண்டறிதல்	K4
CO2	கலைகள் சுட்டும் சிந்தனைக் கோட்பாடுகளைப் பகுத்துணர்ந்து புதியன உருவாக்கும் திறன் பெறுதல்	K5, K6
CO3	கலைகள் உணர்த்தும் விழுமியங்களை அறிந்து வாழ்வில் பயன்படுத்துதல்	K3
CO4	கலைகளைக் கற்றலின் வழி ஆளுமைத் திறனை மேம்படுத்துதல்	K5
CO5	கலைத்துறையில் உள்ள பணி வாய்ப்புகளுக்கான திறன் பெறுதல்	K3

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2	3	1	3	3	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3
CO5	2	2	3	2	3	2	2	2	2	3

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	நுண் கலைகள் – விளக்கம் – கட்டடக் கலை	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	சிற்பக் கலை - வகைகள் – பிரதிமைகள் – ஓவியக் கலை – பழமை - வகைகள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	இசைக்கலை – இசை நுணுக்கம் – அன்னியர் ஆட்சியில் இசைக்கலை	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	கூத்துக் கலை -பதினோரு ஆடல் – பரதநாட்டியம் – தலைக்கோல்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	இலக்கியக் கலை – நாடகக் கலை	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல கலைகள் மற்றும் கலைஞர்கள் குறித்த இன்றைய போக்கினை அறிதல்	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

பார்வை நூல்கள் :

- மயிலை. சீனி. வேங்கடசாமி, (2014), நுண் கலைகள், இரண்டாம் பதிப்பு, பூம்புகார் பதிப்பகம்.
- மயிலை. சீனி. வேங்கடசாமி, (1960), தமிழர் வளர்த்த அழகுக் கலைகள், பாரி நிலையம், சென்னை.

இணையதள முகவரிகள்

- <https://www.tamilvu.org/ta/courses-degree-p102-p1023-html-p1023112-25025>
- <https://www.tamilvu.org/ta/courses-degree-c031-c0312-html-c0312213-17485>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Roo

பாடத்திட்ட வடிவமைப்பாளர் : முனைவர்மே.க.வசந்தி

காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

தேசியத்தர நிர்ணயக்குழுவால் 'A' தகுதி பெற்றது

திருச்சிராப்பள்ளி – 18

தமிழாய்வுத்துறை

தன்னாட்சிப் பாடத்திட்டம்



2022 – 2023

இளங்கலைத் தமிழிலக்கியம்

நான்காம் பருவம்



Cauvery College for Women (Autonomous), Trichy-18

PG & Research Department of Tamil

B.A TAMIL

LEARNING OUTCOME BASED CURRICULAM FRAME WORK (CBCS -LOCF)

(For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester	Part	Course	Course Title	Course Code	I nst. Hrs. /	Credits	Ex a	Exam	Exam	Total
							Hrs.	Int MAR	Ext MAR	
IV	I	Language Course - IV (LC)	பண்டைய இலக்கியமும் உரைநடையும் (Pandaiya Ilakkiyamum Urainadaiyum)	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Intermediate French – II	22ULF4						
			Drama, History of drama Literature	22ULS4						
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature- II	22UE4	6	3	3	25	75	100
	III	Core Course –VII(CC)	தண்டியலங்காரம் (Thandiyalangaaram)	22UTA4CC7	5	5	3	25	75	100
		Core Course –VIII(CC)	சமய இலக்கியம் (Samaya Ilakkiyam)	22UTA4CC8	5	5	3	25	75	100
		Second Allied Course- II (AC)	கணிணித் தமிழ் (Kanini Thamizh)	22UTA4AC4	4	3	3	25	75	100
		Internship		22UTA4INT	-	2	-	-	-	100
	IV	Generic Elective Course- II (GEC)	இதழியல் (Idhazhiyal)	22UTA4GEC2	2	2	3	25	75	100
			Basic Tamil - II	22ULC4BT2						
			Special Tamil - II	22ULC4ST2						
		Skill Enhancement Course – I (SEC)	ஆட்சித் தமிழ்(Aatchi Thamizh)	22UTA4SEC1	2	2	3	25	75	100
		Total			30	25	-	-	-	800

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	பொதுவணியியல் – செய்யுள் வகை அ. முத்தகச் செய்யுள் ஆ. குறளகச் செய்யுள் இ. தொகைநிலைச் செய்யுள் ஈ. தொடர்நிலைச் செய்யுள் தன்மையணி, உவமையணி,	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	உருவகவணி, தீவகஅணி, பின்வருநிலையணி, வேற்றுப்பொருள் வைப்பணி	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	ஒட்டணி, தற்குறிப்பேற்ற அணி ஏது அணி, நுட்ப அணி, இலேச அணி, நிரல் நிரையணி, சுவையணி, தன்மேம்பாட்டுரையணி.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	சிலேடைஅணி, ஒப்புமை கூட்டணி, மாறுபடுபுகழ் நிலையணி, புகழாப் புகழ்ச்சி அணி, வாழ்த்தணி	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	திருக்குறளில் அணி இலக்கணக் கூறுகளைக் கண்டறிதல் உவமையணி:109;118;274;279;308 தீவக அணி:133;255;371;617;773 பின்வருநிலையணி:200;202;225; 310;739 நிரல்நிரையணி:45;182;254;856; 876 சுவையணி:நகை:167;271;774; 839	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

	அழகை:1029;1045;1049			
VI	சுயகற்றல்(இப்பகுதிபருவத்தேர்வுக்கு உரியதல்ல) தண்டியலங்காரம் உரையும் பதிப்பும்		-	

பாட நூல் :

- கொ.இராமலிங்கத் தம்பிரான் (உ.ஆ),(2002) , தண்டியலங்காரம், கழக வெளியீடு, சென்னை.

பார்வை நூல்கள்:

- வ.த.இராமசுப்பிரமணியம் (ப.ஆ) ,(2003), தண்டியலங்காரம், முல்லை நிலையம், சென்னை.
- பரிமேலழகர் (உ.ஆ),(2020), திருக்குறள் , அருணா பப்ளிகேஷன்ஸ், சென்னை.

இணையதள முகவரி:

- www.tamildigitallibrary.in

கற்பித்தல் முறைகள் :

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, GOOGLE MEET, GOOGLE CLASSROOM

பாடத் திட்ட வடிவமைப்பாளர்

முனைவர் ச. தீபா

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	பக்தி இலக்கியம் தோற்றமும்வளர்ச்சியும்-சைவம்- வைணவம்-கிறித்துவம்- இஸ்லாமியம்- பிற்கால பக்தி இலக்கியங்கள்.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	பன்னிருதிருமுறைகள் 1 திருஞானசம்பந்தர் - பூம்பாவைப்பதிகம் _மட்டிட்டபுன்னையங்கானல்என த்தொடங்கும்பாடல்முதல் 11 பாடல்கள் 2.திருநாவுக்கரசர் திருவாவடுதுறைப்பதிகம்- இடரினும்தளரினும் எனத் தொடங்கும் பாடல்முதல் 10 பாடல்கள் 3.சுந்தரர்--ஆலந்தான் உகந்து அமுதுசெய்தான் -எனத் தொடங்கும் பாடல்முதல் 11 பாடல்கள் 4.காரைக்கால்அம்மையார் ;திருவிரட்டை மணிமாலை முதல் 10 பாடல்கள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

III	1.பெருமாள் திருமொழி - குலசேகரஆழ்வார் 10 ஆம்திருமொழி- அங்கண் நெடும் மதில் எனத்தொடங்கும் பாடல்முதல் 10_ பாடல்கள் 2. பெரியதிருமொழி- திருமங்கையாழ்வார் 7_ ஆம்திருமொழி - கறவா மடநாகு எனத் தொடங்கும் பாடல்முதல் 10 பாடல்கள் 3.ஆண்டாள் - ஏழாம்பத்து- கற்பூரம்நாறுமோ எனத் தொடங்கும் பாடல்முதல் 10 பாடல்கள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	1.தாயுமானவர் -பராபரக்கண்ணி 43-56 2. வள்ளலார் -	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	கண்ணதாசன்- இயேசுகாவியம்- மலைப்பொழிவு மு.மேத்தா -நாயகம் ஒருகாவியம் - வள்ளலின்வாழ்வு-போர்முரசு- வாணிகக்கூட்டம் எனும் தலைப்புகள் மட்டும்..	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	மனப்பாடப் பகுதி (சுய கற்றல்) இப்பகுதி இறுதி பருவத்தேர்விற்கு உரியதல்ல 1. மாணிக்கவாசகர் : திருவாசகம் - திருச்சாழல் 2. நாச்சியார் திருமொழி : இரண்டாம் திருமொழி		-	

பாடநூல்கள்

- சுந்தரர்(2011),பன்னிருதிருமுறைகள், ஞானசம்பந்தம் பதிப்பகம் தருமை ஆதீனம் மயிலாடுதுறை
- டாக்டர் நாராயண வேலுப்பிள்ளை,(2011)நாலாயிரதிவ்யப் பிரபந்தம் ,முல்லைநிலையம் சென்னை-17
- வடிவேலுமுதலியார்(உ.ஆ),(2014),தாயுமானவர்பாடல்கள்சாரதா பதிப்பகம்,சென்னை.22
- .மாணிக்கவாசன் (உரையாசிரியர்) திருமூலர், உமாபதிப்பகம், சென்னை.28
- கவியரசுகண்ணதாசன்(1982)இயேசுகாவியம்,கலைக்காவிரி-18 பொன்வெல்ஸ்ரோடு திருச்சிராப்பள்ளி .6200019.
- இ ராமலிங்க அடிகள், (1989) திருவருட்பா, சமரச சன்மார்க்க ஆராய்ச்சி நிலையம் வடலூர்- 303
- மு.மேத்தா-(1994),நாயகம்ஒருகாவியம் ரஹ்மத் பதிப்பகம் ,ரஹ்மத்பில்லிங், பு.எண்.6,2 ஆவது மெயின் ரோடு, சி.ஐ.டிகாலனி _ மயிலாப்பூர்சென்னை _600004

பார்வை நூல்கள்

- முனைவர்விபழனியப்பன், சைவம்வளர்த்ததமிழ் ,மெய்யப்பன்பதிப்பகம் ,சென்னை.
- க வெள்ளைவாரணர், பன்னிருதிருமுறைவரலாறு, முதல்ஏழுதிருமுறைகள் ,அண்ணாமலை பல்கலைக்கழகம், சிதம்பரம்.
- மறைமலைஅடிகள், தமிழர்மதம், பூம்புகார்பதிப்பகம்,,சென்னை

இணையதள முகவரி

- <https://shaivam.org/thirumurai/third-thirumrai/954/thirugnanasambandar-thevaram-thiruvaavaduthurai-idarinum- thalarinum>
- <https:// www.tamilvu.org/ta/library-l4100-html-l4100cor->
- <https://www.tamilvu.org/ta/library-l4210-html-l4210ind->

கற்பித்தல்முறைகள்

குழுக்கலந்தாய்வு, வினாடிவினா திட்டக்கட்டுரை, கரும்பலகை குழுவிவாதம், PPT, GOOGLE MEET, GOOGLE CLASSROOM

பாடத் திட்ட வடிவமைப்பாளர்

முனைவர்பா. கவிதா

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	கணினி அறிமுகம் - கணினியின் வரலாறும் வளர்ச்சியும் - கணினியின் வகைப்பாடு - கணினியின் கட்டமைப்பு - மையச் செயலகம் - உள்ளீட்டகம் - வெளியீட்டகம் - கணினி செயல்படும் விதம் - கணினி வன்பொருட்கள் - முதன்மை வன்பொருட்கள் - துணைமை வன்பொருட்கள்.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	கணினி மென் பொருட்கள் - அமைப்பு, பயன்பாட்டு மென்பொருட்கள் - தமிழ் மென்பொருட்கள் - தமிழ்ச்சொற்பிழை திருத்தி - சந்திப் பிழை திருத்தி - தமிழ் மின்னகராதி - சொற்செயலிகள் - பேச்சுணரி - ஒலி எழுத்துணரி - கையெழுத்துணரி - யாப்பு உணரி - ஒலிபெயர்ப்பு உணரி - எழுத்துமுறை மாற்றி.	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	தமிழ் எழுத்துருக்கள் - தமிழ் எழுத்துரு மாற்றிகள் - மைக்ரோசாப்ட் வேர்டு - மைக்ரோசாப்ட் எக்ஸல் - பவர்பாயிண்ட் - மைக்ரோசாப்ட் அக்சஸ்.	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	இணையம் அறிமுகம் - மின்அஞ்சல் - தமிழ் வலைப்பூக்கள் - வலைப்பூக்கள் உருவாக்கம் - மின்நூல்கள் - மின்நூல் உருவாக்கம் - தமிழ் விக்கிப்பீடியா.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	மின்னூலகம் - ஒலி நூல் - மின்னகராதி - மின்னிதழ் - மின்கற்றல் - பண்புகள், பயன்கள், வகைகள், தமிழ்மொழி கற்றலின் நிலைகள் - இணையவழிக் கல்வியும், தமிழ் இணையக் கல்விக்கழகமும் - சமூக இணைய தளங்களும், தமிழ்க் கல்வியும்.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல தமிழ் மென்பொருட்கள் தோற்றமும் வளர்ச்சியும் – கணினித் தமிழ் வளர்வதற்கு உண்டான வழிகள்.	-		

பாட நூல் :

1. முனைவர் இல. சுந்தரம் (2015), கணினித் தமிழ், விகடன் பிரசுரம், சென்னை.
2. முனைவர் துரை. மணிகண்டன் (2023), தமிழ்க் கணினி இணையப் பயன்பாடுகள், மணிவானதி பதிப்பகம், தஞ்சாவூர்.

பார்வை நூல் :

1. இராதா செல்லப்பன் (2011), தமிழும் கணினியும், கவிதை அமுதம் வெளியீடு, திருச்சி – 21.

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழு விவாதம்

Web Resources

<https://www.tamildigitallibrary.in/>

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் ப. சசிரேகா

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	இதழியல் விளக்கம் – வளர்ச்சி – வரலாறு – வகைகளும், இயல்புகளும் – இதழ்களின் சுதந்திரம் – பத்திரிகைச் சட்டங்கள்.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	தமிழகத்தில் இதழ்கள் – வளர்ச்சி – இதழ்கள் தொடங்குவதற்குரிய வழிமுறைகள்.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	செய்தி – விளக்கம் – இயல்புகள் – வகைகள் – உள்ளடக்கங்கள் – செய்தி நிறுவனங்கள் – பேட்டி – செய்தித்தாள் நிர்வாக அமைப்பு – ஆசிரியப் பிரிவு – விளம்பரம்.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	துணுக்குகள் – கேலிச் சித்திரங்கள் – செய்திகளைச் செப்பணிடுதல் – ஆசிரியர் – செய்தி ஆசிரியர் – துணையாசிரியர் – செய்தியின் கட்டமைப்பு – அச்சுப்படி திருத்துதல்.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	இதழியல் மொழிநடை – தலையங்கம் – சிறப்புத்தனிக் கூறுகள் – இதழ்களில் எழுதுவது எப்படி – அச்சுப்பிழை திருத்தக் குறியீடுகள்.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல கல்வி வளர்ச்சியில் இதழ்களின் பங்கு – விடுதலைப்போராட்டத்தில் தமிழ் இதழ்கள் – இலக்கிய இதழ்கள்.	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

பாட நூல் :

1. மா. பா. குருசாமி – இதழியல் கலை, குரு.தேமொழி, தாயன்பகம், ஆறாவது தெரு, ஏ.கே.எம்.ஜி.நகர், திண்டுக்கல் - 624001

பார்வை நூல் :

1. முனைவர் கி. இராசா – மக்கள் தகவல் தொடர்பியல், பாவை பப்ளிகேஷன்ஸ், 142, ஜான்கான்சாலை, இராயப்பேட்டை, சென்னை – 14.

fw;gpj;jy; Kiwfs;

கலந்தாய்வு, வினாடிவினா, திட்டக்கட்டுரை, கரும்பலகை, குழு விவாதம்

Web Resources

<https://www.tamildigitallibrary.in/>

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் மே. க. வசந்தி

Semester III	Internal Marks : 25	External Mark 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
22ULC4BT2	அடிப்படைத் தமிழ் – II (BASIC TAMIL – II)	GEC	2	2

நோக்கம் :

- தமிழ் மொழியின் அடிப்படைகளை இலக்கணங்களை அறியச் செய்தல்
- கடிதம், கதைகளை எழுதக் கற்றுக் கொள்ளுதல்.

COURSE OUTCOMES

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்.

CO No.	CO Statement	Cognitive Level
CO1	தமிழின் அடிப்படை இலக்கணம் அறிதல் வழி மொழித்திறன் பெறுதல்	K1
CO2	எண்ணுப் பெயர்களின் தனித்தன்மையை அறிதல்	K2
CO3	கடிதம் எழுதக் கற்பதன் வழி படைப்பாக்க உத்தியைக் கற்றல்	K3
CO4	மழலைப் பாடல்கள் குறித்துப் பகுத்தறிதல்	K4
CO5	போட்டித் தேர்வுக்கேற்றவகையில் தமிழின் அடிப்படையைக் கற்றுத் தேர்தல்	K4

Mapping of CO with Po and PSO

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2	3	1	3	3	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3
CO5	2	2	3	2	3	2	2	2	2	3

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	இருதிணை (உயர்திணை, அஃறிணை) – ஐம்பால் (ஆண்பால், பெண்பால், பலர்பால், ஒன்றன் பால், பலவின் பால்) – பொருளுணர்ந்து பேசுதல், எழுதுதல்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	எண்களைத் தமிழில் எழுதுதல் (1 - 20) – 5 மற்றும் 10-ன் அடுக்குகள் (100 வரை) – எண்ணுப் பெயர்களைக் கொண்டு வாக்கியம் அமைத்தல்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	கடிதம் எழுதுதல் - முகவரி, உடலமைப்பு, கையொப்பம், ஊர், நாள், உறைமேல் முகவரி – அமைப்பு அறிதல்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	மழலைப் பாடல்கள் (வட்டமான தட்டு, நிலா நிலா ஓடிவா, குள்ள குள்ள வாத்து) – ஆத்திசூடி – அ முதல் ஃ வரை (ஒளவையார்) – பிழையின்றி எழுதுதல்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	அறநெறிக் கதைகள் (அறிவுள்ள காகம், எலியும் சிங்கமும், வேடனும் புறாக்களும்) – பிழையின்றி வாசித்தல், எழுதுதல்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல அன்றாட வாழ்வில் அனைவரும் பயன்படுத்தும் பொருட்கள் பற்றிய சொற்களை எழுதுதல்	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

கற்பித்தல் முறைகள்

எழுத்துப் பயிற்சி, கலந்தாய்வு, கரும்பலகை, குழுவிவாதம்

Web Resources

https://tamilsirukathaistories.blogspot.com/2019/01/blog-post_50.html?m=1

<https://www.tamilsirukathaigal.com/2014/01/lion-and-mouse-story-in-tamil.html>

பாடப்பகுதி வடிவமைப்பாளர் முனைவர் மு.அனு

Semester IV	Internal Marks : 25	External Mark 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
22ULC4ST2	சிறப்புத் தமிழ் – II (SPECIAL TAMIL – II)	GEC	2	2

நோக்கம் :

- சங்க இலக்கியங்கள் பற்றி அறிந்து கொள்ளுதல்
- அற இலக்கியங்களைப் பயில வேண்டியதன் அவசியத்தை உணர்த்துதல்
- சிற்றிலக்கியங்கள் வாயிலாக மாணவர்களின் கற்பனை ஆற்றலை வளர்த்தல்.

COURSE OUTCOMES

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்.

CO No.	CO Statement	Cognitive Level
CO1	சங்கத் தமிழர்களின் வாழ்வியல் கூறுகளைக் கண்டறிந்து தற்காலச் சூழலோடு பொருத்திப் பார்த்தல்	K1
CO2	அறவாழ்க்கையின் வழி மொழி வழக்காறுகளைக் கண்டறிந்து மதிப்பீடு செய்தல்	K2
CO3	இலக்கியங்கள் உணர்த்தும் வாழ்வியல் விழுமியங்களை அறிதல்	K3
CO4	இலக்கியங்களைப் பயின்று போட்டித் தேர்வுகளுக்குத் தேவையான இலக்கியக் கூறுகளை ஆராய்ந்தறிதல்	K4
CO5	மாறிவரும் சூழலுக்கேற்ப பணிவாய்ப்பினைப் பெறுவதற்கான தகுதிகளை உருவாக்கிக்கொள்ளல்	K5

Mapping of CO with Po and PSO

	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	2	3	1	3	3	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3
CO5	2	2	3	2	3	2	2	2	2	3

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOUR S	COs	COGNITIVE LEVEL
I	குறுந்தொகை – 4 பாடல்கள் 1. 'கொங்குதேர் வாழ்க்கை' (பா.எண் -2), 2. 'நிலத்தினும் பெரிதே' (பா.எண் -3), 3. நள்ளென்றன்றே யாமம்' (பா.எண் -6), 4. 'கழனி மாஅத்து' (பா.எண் - 8), புறநானூறு – 2 பாடல்கள் 1. கல்வியின் சிறப்பு (பா.எண் - 183) 2. முறையான வரி பெறுக (பா.எண் - 184) ஐங்குறுநூறு – வேழப்பத்து (மருதம்) 1- 5 பாடல்கள் 1. 'மனைநாடு வயலை வேழம் சுற்றும்' 2. 'கரை சேர் வேழம்' 3. 'பரியுடை நல்மான் பொங்குஉளை' 4. 'கொடிப் பூ வேழம்' 5. 'மணல் ஆடு மலிர்நிறை'	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	திருக்குறள் - வினைத்திட்டம் ஏலாதி – முதல் ஐந்து பாடல்கள் 1. 'சென்ற புகழ்' 2. 'கொலைபுரியான்' 3. 'தவம் எளிது' 4. 'இடம்தீர்த்தல்' 5. 'தனக்கு என்றும்' இனியவை நாற்பது முதல் ஐந்து பாடல்கள் 1. 'பிச்சை புக்காயினும்' 2. 'உடையான் வழக்கு' 3. 'ஏவது மாறா' 4. 'யானையுடைப் படை' 5. 'கொல்லாமை'	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

III	குற்றாலக்குறவஞ்சி – குறத்தி மலை வளம் கூறல் (பாடல் எண் – 54) முக்கூடற்பள்ளு – விதைவகைகளும் மாட்டின் வகைகளும் (பாடல் எண் – 109,110)	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	இளையான்குடிமாறநாயனார் புராணம் – 27 பாடல்கள்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	இலக்கிய வரலாறு (பாடத்திட்டத்திற்கு உட்பட்ட பகுதிகள் மட்டும்) - குறுந்தொகை, ஐங்குறுநூறு, புறநானூறு, திருக்குறள், ஏலாதி, இனியவை நாற்பது குற்றாலக்குறவஞ்சி, முக்கூடற்பள்ளு, பெரியபுராணம்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல புறநானூறு – 192 ஆவது பாடல் ‘யாதும் ஊரே யாவரும் கேளிர்’	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

கற்பித்தல் முறைகள்

எழுத்துப் பயிற்சி, கலந்தாய்வு, கரும்பலகை, குழுவிவாதம்

Web Resources

<https://www.inidhu.com/%E0%AE%87%E0%AE%B3%E0%AF%88%E0%AE%AF%E0%AE%BE%E0%AE%A9%E0%AF%8D%E0%AE%95%E0%AF%81%E0%AE%9F%E0%AE%BF-%E0%AE%AE%E0%AE%BE%E0%AE%B1%E0%AE%A8%E0%AE%BE%E0%AE%AF%E0%AE%A9%E0%AE%BE%E0%AE%B0%E0%AF%8D/>

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் செ. புனிதா

பாடத்திட்டம்				
UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
1	ஆட்சிமொழி-தமிழ் ஆட்சிமொழியான வரலாறு- ஆட்சித் தமிழ் விளக்கம் -ஆட்சித் தமிழ்த் தோற்றம் வளர்ச்சி-அரசியல் சட்டப்படி ஆட்சிமொழி- காலந்தோறும் ஆட்சிமொழி – ஆட்சி மொழிச் சட்டம்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
2	ஆட்சிமொழித் திட்ட அரசாணைகள்- அறிவிக்கைகள்-கடிதங்கள்-அறிவிப்புகள்- தமிழை ஆட்சிமொழியாக்கத் தனிப்பட்டுத் முயற்சிகள்- அமைப்புகளின் முயற்சிகள்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
3	ஆட்சிமொழிச்சொற்கள் -அகராதிகள் – தமிழில் அகராதிகளின் தோற்றம் – கலைச் சொல்லாக்கமும் அகராதிகளும் - அகராதிகளின் செயல்பாடு – சொல்லாக்க அகராதிகளில் சில சிக்கல்கள் -தமிழ் வளர்ச்சித் திட்டங்களும் பணிகளும்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
4	ஆட்சிமொழி தமிழ்த் திட்டச் செயலாக்கத்தில் தமிழ்நாடு அரசின் ஊக்கமும், ஆக்கமும், பரிசு வழங்கும் திட்டம் – தமிழ் வளர்ச்சிக்கான சிறந்த நூல்களை வெளியிடுவதற்கு நிதியுதவி வழங்கும் திட்டம்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
5	கலைச்சொல்லாக்கம்- தரப்படுத்துதல்- தமிழ்மொழியில் கலைச்சொற்கள்- கண்டுப்பிடிப்புகளும் கலைச் சொற்களும் – கலைச்சொற்கள் விளக்கம் – கலைச் சொல் அல்லாதவை - கலைச்சொற்களை உருவாக்கும் முறை – பழைய தமிழ் கலைச்சொற்களுக்குப் புதிய பயன்பாடு தருதல்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

6	சுய கற்றல் (இப்பகுதி பருவத்தேர்விற்குரியதல்ல) தமிழ்ஆட்சிமொழி சிக்கல்களும் தீர்வுகளும்			

பாடநூல்

முனைவர் கீதா கி., முனைவர் யசோதா அ, (2023) ஆட்சித் தமிழ், நியூ செஞ்சுரி புக் ஹவுஸ், அம்பத்தூர், சென்னை 600050

பார்வை நூல்கள்

1. முனைவர் நாகராசன் ச., (1999) ஆட்சித்தமிழ் தமிழ் வளர்ச்சி இயக்ககம் சென்னை 600108
2. டாக்டர் பெரியாண்டவர் த., ஆட்சித்தமிழ், வளர்த்தமிழ் பதிப்பகம், அஞ்சுகம் நகர் சென்னை -6000095
3. டாக்டர் மலையமான் , தமிழ்ஆட்சிமொழி சிக்கல்களும் தீர்வுகளும், அன்பு பதிப்பகம், 63 டாக்டர் ரங்காச்சாரி சாலை சென்னை -600018

WEB SOURCES

https://cms.tn.gov.in/sites/default/files/documents/tamil_t.pdf

<https://groups.google.com/g/thamizayam/c/rNgffQMd6Wl>

<https://www.tamilvu.org/ta/courses-degree-p201-p2012-html-p2012034-27413>

கற்பித்தல்முறைகள்

குழுக்கலந்தாய்வு, வினாடிவினா, திட்டக்கட்டுரை, கரும்பலகை, விவாதம். PPT, GOOGLE MEET, GOOGLE CLASS ROOM, MOOC, SWAYAM, NPTEL, Website etc.

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் தி.மணிமொழி

காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

தேசியத்தர நிர்ணயக்குழுவால் 'A' தகுதி பெற்றது

திருச்சிராப்பள்ளி – 18

தமிழாய்வுத்துறை

தன்னாட்சிப் பாடத்திட்டம்



2022 – 2023

இளங்கலைத் தமிழிலக்கியம்

ஐந்தாம் பருவம்



Cauvery College for Women (Autonomous), Trichy-18

PG & Research Department of Tamil

B.A TAMIL

LEARNING OUTCOME BASED CURRICULAM FRAME WORK (CBCS -LOCF)

(For the Candidates admitted from the Academic year 2022-2023 onwards)

V	III	Core Course – IX(CC)	நம்பியகப்பொருள் (Nambiyagapporul)	22UTA5CC9	6	6	3	25	75	100
		Core Course – X(CC)	பதினெண் கீழ்க்கணக்கு – அறம் (Pathinen keezhkanakku-Aram)	22UTA5CC10	5	5	3	25	75	100
		Core Course – XI(CC)	காப்பிய இலக்கியம் (Kaappiya Ilakkiyam)	22UTA5CC11	5	5	3	25	75	100
		Core Course – XII(CC)	மொழி வரலாறு (Mozhi Varalaaru)	22UTA5CC12	5	5	3	25	75	100
		Discipline Specific Elective – I(DSE)	A.கோயிற்கலை(Koyir Kalai)	22UTA5DSE1A	5	4	3	25	75	100
			B.ஊடகத் தமிழ் (Oodaga Thamizh)	22UTA5DSE1B						
			C.பயண இலக்கியம் (Payana Ilakkiyam)	22UTA5DSE1C						
	IV	Ability Enhancement Compulsory Course- IV(AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II(SEC)	பயன்பாட்டுத் தமிழ் (Payanbaattu Thamizh)	22UTA5SEC2	2	2	3	25	75	100
		Total			30	29	-	-	-	700

பாடத்திட்டம்				
UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	பாயிரம் , சிறப்புப் பாயிரம்	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	அகத்திணையியல்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	களவியல், கற்பியல்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	வரைவியல் , ஒழிபியல்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	குறுந்தொகை அறத்தொடு நின்றல் துறை பாடல்களை நம்பியகப்பொருளுடன் ஒப்பிட்டுப் பார்த்தல். பா.எண் 15,23,26,31,214,259,321,333,374,379	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல நம்பியகப்பொருளின் கட்டமைப்பு		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

பாடநூல்

- கோவிந்தராச முதலியார்(உ.ஆ) , (2002), நம்பியகப்பொருள், கழக வெளியீடு,சென்னை

பார்வை நூல்

- வ.சுப.மாணிக்கம், (2004), தமிழ்க்காதல், மெய்யப்பன் பதிப்பகம், சிதம்பரம்
- உ.வே.சா, (உ.ஆ) , (2005), குறுந்தொகை மூலமும் உரையும்,டாக்டர் உ.வே.சா நூல் நிலையம்,சென்னை

இணையதள முகவரிகள் ; <https://www.tamildigitallibrary.in/>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடிவினா, திட்டக் கட்டுரை, குழுவிவாதம், கரும்பலகை

பாடத்திட்ட வடிவமைப்பாளர்

முனைவர் க.அகல்யா

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	திருக்குறள் : அறத்துப்பால் - அன்புடைமை, விருந்தோம்பல், இனியவை கூறல், செய்ந்நன்றி அறிதல், நடுவுநிலைமை, ஒழுக்கமுடைமை, பொறையுடைமை, அழுக்காறாமை, புறந்கூறாமை, ஈகை, மக்கட்பேறு, இல்வாழ்க்கை. பொருட்பால் - கல்வி, மானம், நட்பு.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	நாலடியார் - செல்வம் நிலையாமை, துறவு. நான்மணிக்கடிகை - 4 முதல் 8 பாடல்கள் வரை. திரிகடுகம் - 27 முதல் 41வது பாடல்கள் வரை.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	பழமொழி நானூறு - இன்னா செய்யாமை (8 பாடல்கள்), முயற்சி (12 பாடல்கள்) முதுமொழி காஞ்சி - 1 முதல் 50 பாடல்கள் வரை.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	இன்னா நாற்பது - 1 முதல் 20 பாடல்கள். இனியவை நாற்பது - 11 முதல் 30 பாடல்கள்.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	ஏலாதி - 1 முதல் 20 பாடல்கள். சிறுபஞ்சமூலம் - 1 முதல் 20 பாடல்கள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல திருக்குறள் மற்றும் நாலடியாரின் நட்பு குறித்த ஒப்பீடுகள்	-		

பார்வை நூல் :

- ராஜம். எஸ்., (1959), (முதற்பதிப்பு), பதினெண்கீழ்க்கணக்கு (முதல்தொகுதி, இரண்டாம்தொகுதி), சென்னை.

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழு விவாதம்

Web Resources Tamil Heritage Foundation- www.tamilheritage.org

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் மே. க. வசந்தி

பாடத்திட்டம் – SYLLABUS				
UNIT	CONTENT	HRS	COs	COGNITIVE LEVEL
I	சிலப்பதிகாரம் – புகார்காண்டம்முழுவதும்	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	மணிமேகலை – துயிலெழுப்பியகாதை, மணிபல்லவத்துத்துயருற்றகாதை ,பாத்திரம்பெற்றகாதை , சிறைக்கோட்டம்அறக்கோட்டமாக்கியகாதை சீவகசிந்தாமணி- விமலையார் இலம்பகம்	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4 K5
III	கம்பராமாயணம் – இரணியன் வதைப் படலம் சூளாமணி – நகரச் சருக்கம் – (31 _38 பாடல்கள் வரை)	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4 K5
IV	பெரிய புராணம் – பூசலார் நாயனார் புராணம் வில்லி பாரதம் – ஆதி பருவம் – வாரணச் சருக்கம்	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4 K5
V	சீறாப்புராணம் – கரம் பொருத்து படலம் தேம்பாவணி – வளன் சனித்த படலம்	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4 K5
VI	சுயகற்றல் - இப்பகுதிபருவத்தேர்விற்குஉரியதல்ல இயேசு காவியம் – உயிர்த்தெழுதல்	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4 K5

பார்வை நூல்கள்

- மாணிக்கவாசகர்.நா. (1998), சிலப்பதிகாரம், உமாபதிப்பகம், சென்னை -1.
- என்.எம். வேங்கடசாமி, (உ.ஆ.), (1985), மணிமேகலை, கழகவெளியீடு, சென்னை
- திரு. புலவர். அரசு, (உ.ஆ.), (1967), பெரிய புராணம், கழகவெளியீடு, சென்னை
- புலவர். அ. மாணிக்கனார், (உ.ஆ.), (1995), தமிழ் நிலையம், சென்னை.
- வ.த. இராமசுப்ரமணியன், (1995), கம்பராமாயணம், திருமகள் நிலையம், சென்னை.
- எம். நாராயண வேலுப்பிள்ளை, துரைராஜாராம், வ.த. இராமசுப்ரமணியன், (உ.ஆ.), (2013), பூம்புகார் பதிப்பகம், சென்னை.
- உமறுப்புலவர், சீறாப்புராணம், கொங்கு நூல் பதிப்பகம், சென்னை.
- பி.ரா.நடராஜன், (உ.ஆ.), (2015),திருவிளையாடற் புராணம், சாரதா பதிப்பகம், சென்னை.
- கண்ணதாசன், (1962), இயேசு காவியம், பழநியப்பா பதிப்பகம், சென்னை.
- கி.வா.ஜகந்நாதன், (1962), தமிழ்க்காப்பியங்கள், அமுத நிலையம், சென்னை.
- தோலாமொழித்தேவர், (2019), சூளாமணி மூலமும் உரையும், கௌரா பதிப்பகம், சென்னை.

இணையதள முகவரி

- <https://ta.wikipedia.org/wiki%E0%AE%95%>
- <https://www.tamilvu.org/ta/library-13700-html-13700ind133880->
- <https://www.tamilvu.org/courses/degree/p104/p1042/html/p1042111.htm>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, GoogleMeet, Google Class Room.

பாடத்திட்ட வடிவமைப்பாளர்

திருமதி பொ. அபிராமி

Semester II	Internal Marks : 25	External Mark 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
22UTA5CC12	மொழி வரலாறு	CC	5	5

நோக்கம் :

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive Level
CO1	தமிழ்மொழியைப் பிழையின்றி அறிவதன்வழி மொழிப் பயன்பாட்டினைப் புரிந்துகொள்ளல்	K1, K2
CO2	மொழியின் தோற்றம் வரலாற்றுச் சூழலை அறிதல்	K2
CO3	தமிழ் மொழிக்கோட்பாட்டினைக் கண்டறிதல்	K3
CO4	மொழி உருவாக்கத்திற்குரிய கூறுகளைப் பகுத்தறிதல்	K4
CO5	போட்டித் தேர்வுகளுக்கேற்ப மொழி வரலாற்றைக் கண்டு தேர்தல்	K4

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2	3	1	3	3	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3
CO5	2	2	3	2	3	2	2	2	2	3

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	அரிய கலை –பேச்சு மொழியும் எழுத்து மொழியும்—உணர்ச்சி-அறிவு –செயல் மொழியின் பண்பாடு.- போலச் செய்தல் ஒப்புமை ஆக்கம் -வழக்கம் - இலக்கணம் -ஒரு பொருட்கிளவி.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	கடன் வாங்கல் -மருஉ -ஒலித் திரிபு- இலக்கிய மொழியின் செல்வாக்கு -கிளைமொழி,-- பொதுமொழி- சிறப்பு மொழி - குறுமொழி, -குழந்தை மொழி.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	மொழியின் தோற்றம் -பண்பட்ட நிலை ஆராய்ச்சி முயற்சிகள்- மூளை வளர்ச்சி -குகையும் அரண்மனையும்- அடிச்சொற்கள்- சைகை மொழி -நாகரிகம் வளராதவர் மொழி- குரல் ஒலி - போலி மொழி-பண்மொழி- தொழில்ஒலி-இன்பப்பாட்டு-.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	மொழிநிலை-தனிநிலை.- ஒட்டு நிலை - உட்பிணைப்பு நிலை.- திராவிட மொழியினம்- ஆரிய மொழியினம்.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	தமிழ் எழுத்தின் தோற்றம்- ஓவிய எழுத்து -அடையாளஎழுத்துக்கள்- அசையோவிய எழுத்து- ஒலிஎழுத்துக்கள் - ஆப்பு வடிவஎழுத்துக்கள்- அரபி எழுத்துக்கள் -அசை எழுத்துக்கள்- பேச்சும் எழுத்தும்- எழுத்தும் ஒலியும் - திராவிடமொழிகளின்எழுத்துக்கள்-	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

VI	(சுயகற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல தமிழ்எழுத்து வரலாறு.	-		

பாட நூல்:

டாக்டர் மு வரதராசன், (1954)மொழி வரலாறு, பாரி நிலையம், 88/1 184 ,பிராட்வே சாலை.,சென்னை 600104.

பார்வை நூல் :

சக்திவேல்.சு. தமிழ் மொழிவரலாறு, மணிவாசகர் பதிப்பகம் ,சென்னை

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Room.

பாடப்பகுதி வடிவமைப்பாளர் :

முனைவர்அ.இரா.கோமதி

முனைவர் வி.கவிதா

பாடத்திட்டம் – SYLLABUS				
UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
1	திருக்கோயில்களின் துவக்க காலம் - கோயில் விளக்கம் - கோயில் வகைகள் - குடைவரைக் கோயில்கள் - பிள்ளையார்ப்பட்டி - மலையடி குறிச்சி - யானைமலை - நரசிம்மர் - லாடன் கோயில் - திருப்பரங்குன்றம் - உமையாண்டார் கோயில் - திருச்சி குடைவரைக் கோயில்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
2	ஒற்றைக்கல் கோயில்கள் - கழுகுமலை - வெட்டுவான் கோயில்கள் - மகாபலிபுரம் பஞ்சபாண்டவர்கள் ரதங்கள் - கணேசரதம் - பிடாரி ரதம் - வலயன் குட்டைரதம் - ளகற்றளிகள் - கோயில் அங்கங்கள் - அதிட்டான உறுப்புகள் - கூரை - விமானத் தளங்கள் - கோபுரங்கள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
3	பல்லவர் கோயில்கள் - இராசசிம்மன் கோயில்கள் - கடற்கரைக் கோயில்கள் - பனைமலைக்கோயில் - உத்தரமேரூர் - நார்த்தாமலை கோயில்கள் - கொடும்பாளூர் மூவர் கோயில் - ஆதித்தன் காலக் கோயில்கள் - பராந்தகன் காலக் கோயில்கள் - செம்பியன் மாதேவியின் கோயில் பணி	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
4	முதலாம் இராசராசன், முதலாம் இராசேந்திரன் காலக் கோயில்கள் - முதலாம் குலோத்துங்கனின் பாணி - இரண்டாம் குலோத்துங்கனின் காலம் - மூன்றாம் குலோத்துங்கன் காலக் கோயில்கள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
5	பிற்காலப் பாண்டியர் கோயில்கள் - விஜயநகர கலைப் பாணிகள் - கோயில்	15	CO1 CO2 CO3 CO4	K1 K2 K3 K4

	இடத்தேர்வு - நீர் உறிஞ்சும் தன்மை - மண்மணம் அறிதல் - கட்டடக் கலைஞர்கள் - கட்டடக்கலை அளவை முறை		CO5	
6	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல நும் ஊரில் உள்ள கோயில்களுள் ஏதேனும் ஒரு கோயிலின் கலைப்பணி வரலாற்றை ஆய்வு செய்க.	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

பாட நூல்

- இராசேந்திரன்.பெ , (1985), கோயில்கலை, நியூ செஞ்சுரி புக்ஹவுஸ், சென்னை.

பார்வை நூல்கள்

- வெங்கட்ராமன் ஆர், (1985), இந்தியக் கோயில் கட்டடக்கலை வரலாறு, என். எஸ்.பப்ளிகேஷன் , மதுரை.
- நாகசாமி.இரா, சுந்தரமூர்த்தி.மா, (1973) தமிழகக் கோயில் கலைகள், தமிழ்நாடு அரசு தொல் பொருள் ஆய்வுத்துறை.
- இராசமாணிக்கம், (1984), தமிழகக் குடைவரைக் கோயில்கள், சைவசித்தாந்த நூற்பதிப்புக் கழகம், சென்னை.

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக் கட்டுரை, கரும்பலகை, குழு விவாதம்,

PPT,google meet, google classroom, mooc, swayam, nptel, website etc.

Web Resources

- www.sangatamil.com
- www.tamilvu.org
- www.noolaham.in
- www.projectmadurai.org
- www.chennai library.com
- <http://kalithogai.blogspot.in>

பாடப்பகுதி வடிவமைப்பாளர் - முனைவர் இரா.வனிதா

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	ஊடகங்கள் : விளக்கம் - தகவல் தொடர்பியல் - தகவல் தொடர்பும் ஊடகமும் - மக்கள் தகவல் தொடர்பியல் - தொடர்பியல் கூறுகள் - தகவல் தொடர்பில் ஊடகங்களின் பங்கு - ஊடகங்களின் வகைகள் - மரபுசார் ஊடகங்கள் - அச்ச வழி ஊடகங்கள் - மின் வழி ஊடகங்கள் - மின்னணு ஊடகங்கள்.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	அச்சவழி ஊடகங்கள் : இதழ்கள் - தோற்றமும் வளர்ச்சியும் - இந்திய இதழ் - 19ம் நூற்றாண்டில் இதழியல் - தமிழகத்தில் இதழியல் வரலாறு - தனிச்சிறப்புகள் - வகைகள் - வகுப்பு முறை - இதழியல் பொறுப்புகள் - பணிகள் - கொள்கைகள் - அமைப்பு முறை - தலையங்கம் - செய்தி.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	செய்தியின் வகைகள் - உள்ளடக்கங்கள் - செய்தி எழுதும் முறை - புகைப்படங்கள் - படங்களின் வகைகள் - கருத்துப்படங்கள் - படத்துணுக்குகள் - கேலிச்சித்திரங்கள் - விளம்பரம் - நூல் மதிப்புரை - துணுக்குகள்.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	மின் வழி ஊடகங்கள் : வானொலி - வரலாறு - இந்தியாவில் வானொலி - ஒளிபரப்பு முறைமைகள் - நிகழ்ச்சிகள் - தொலைக்காட்சி - தோற்றமும் வளர்ச்சியும் - இந்தியாவில் தொலைக்காட்சி வரலாறு - நிகழ்ச்சிகள் - செய்திகள் - நேர்காணல் - தொலைக்காட்சியின் செல்வாக்கு.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

V	மின்னணு ஊடகங்கள் : கணிப்பொறி - வரலாறு - வகைகள் - செயல்பாடு - பயன்பாடு - கணினி அச்சு - விண்டோஸ் இணையம் - தோற்றமும் வளர்ச்சியும் - தமிழில் இணையம் - கட்டுப்பாட்டகம் - இணைய முகவரி - வலைப்பின்னலின் வகைகள் - இணைய நூலகம் - இதழ்கள் - வலைப்பூ - மின்னஞ்சல் - கூகுள் - முகநூல் - ஆர்க்டு - ட்விட்டர்.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல அச்சு வழி ஊடகங்களில் மொழியின் பயன்பாடு - மின்வழி, மின்னணு ஊடகங்களில் மொழியின் பயன்பாடு.	-		

பாட நூல் :

01. டாக்டர் த. ரெஜித் குமார், (2018), ஊடகவியல், நியூ செஞ்சுரி புக் ஹவுஸ், அம்பத்தூர், சென்னை.

பார்வை நூல் :

01. முனைவர் கி. ராசா, (2003), மக்கள் தகவல் தொடர்பியல், பாவாணர் ஏடகம், சென்னை.

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழு விவாதம்

Web Resources

- https://ta.wikipedia.org/wiki/%E0%AE%8A%E0%AE%9F%E0%AE%95%E0%AE%B5%E0%AE%BF%E0%AE%AF%E0%AE%B2%E0%AF%8D_%E0%AE%A4%E0%AE%B2%E0%AF%88%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AF%81%E0%AE%95%E0%AE%B3%E0%AF%8D_%E0%AE%AA%E0%AE%9F%E0%AF%8D%E0%AE%9F%E0%AE%BF%E0%AE%AF%E0%AE%B2%E0%AF%8D

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் ப. சசிரேகா

பாடத்திட்டம் – SYLLABUS				
UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
1	பயண இலக்கியம் – விளக்கம் – தோற்றமும் வளர்ச்சியும் - வகைகள் – தமிழில் பயண இலக்கியம் – குறிப்பிடத்தகுந்த பயண நூல்களும் ஆசிரியர்களும் – பயண இலக்கியத்தின் பயன்கள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
2	ஆஸ்திரேலிய மக்கள் – ஆஸ்திரேலியாவின் வாழ்க்கைத்தரம் – பொழுதுபோக்கு வசதிகள் - விசித்திரமான கலாச்சாரம் – அரசின் அளவு கடந்த உதவிகள் - ஆஸ்திரேலியர்களின் விளையாட்டு ஆர்வம் – கட்டுப்பாட்டிற்குள் விலைவாசி	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
3	கடமை தவறாத மக்கள் – கூடுதல் வருமானமும், உயர்ந்த வாழ்க்கைத்தரமும் – அரசின் உதவிகள் - மிக உயர்ந்த கல்வித்தரம் – கேளிக்கை மற்றும் சூதாட்ட விடுதிகள் – ஓய்வுநேரப் பொழுதுபோக்கு – அழகு மிளிரும் நகரங்கள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
4	கடலளவு வெளிச்சம் – பாடப் புத்தகங்களுக்கு வெளியே – நிலமெங்கும் பூக்கள் – அருவியாடல் – அறிந்த ஊர் – காற்றின் ஊற்று	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
5	விடுமுறைக் கனவுகள் – திரைக்குப் பின்னால் – தூரத்து மணியோசை – உறங்கும் கடல் – உலகு அறிதல் – நோக்கும் திசையெல்லாம்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல பயண இலக்கிய நூல் குறித்து ஆய்வு	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

பாட நூல்கள்

பி.எம்.இராமசாமி, (2012) ஆஸ்திரேலியாவில் அறுபது நாட்கள், நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட், சென்னை – 600 098.

எஸ்.ராமகிருஷ்ணன், (2018), தேசாந்திரி, தேசாந்திரி பதிப்பகம், சென்னை – 600 093

பார்வை நூல்கள்

பேரா.ம.இரா.தங்கமணி, (1992), சுற்றுலாவியல் ஓர் அறிமுகம், கொங்கு பதிப்பகம், கரூர்.

இணையதள முகவரிகள்:

<https://www.keetru.com/index.php/2014-03-08-04-35-27/2014-03-08-12-20-13/18372-2012-02-06-04-27-45>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக் கட்டுரை, கரும்பலகை, குழு விவாதம், PPT. GOOGLE MEET, GOOGLE CLASSROOM, MOOC, SWAYAM, NPTEL, Website etc.

பாடத்திட்ட வடிவமைப்பாளர் – முனைவர் செ. புனிதா

பாடத்திட்டம் – SYLLABUS				
UNIT	CONTENT	HOURLS	COs	COGNITIVE LEVEL
I	பெயர்ச்சொல் - இடுகுறிப்பெயர் - காரணப்பெயர் - காரண இடுகுறிப்பெயர் - பொருள், இடம், காலம், சினை, பண்பு தொழிற் பெயர்கள் -வினையாலணையும் பெயர் - ஆகுபெயர் - குடிப்பெயர் - வினாப்பெயர் - தொகுதிப்பெயர் - மூவிடப்பெயர்கள்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	எழுத்துப் பிழை நீக்கம் - வலி மிகுமிடங்களும் மிகாவிடங்களும் -சந்தி விதிகள் - சொற்றொடர் மாற்றம் - தன்வினை, பிறவினை, செய்வினை, செயப்பாட்டு வினை, உடன்பாட்டு வினை - எதிர்மறை வினை	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	எழுத்தும் சொல்லும் வாக்கியத்திற்குக் கருவிகள் - வாக்கிய வரலாறு - வாக்கியம் என்றால் என்ன? - வாக்கிய வகைகள் - கருத்துவகை - செய்தி வாக்கியம் - வினாவாக்கியம் - விழைவு வாக்கியம் - உணர்ச்சி வாக்கியம் - அமைப்பு வகை	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	பிழையான சொற்களும் திருத்தங்களும் - நேர்க்கூற்றை அயற்கூற்றாக மாற்றுதல் - ஒரே கருத்தை மூன்று விதமாக மாற்றிக் கூறுதல்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	நிறுத்தக்குறிகள் - காற்புள்ளி- அரைப்புள்ளி - முக்காற்புள்ளி - முற்றுப்புள்ளி - வினாக்குறி - உணர்ச்சிக்குறி - இரட்டை மேற்கோட்குறி - ஒற்றை மேற்கோட்குறி - தொடர் விடுபாட்டுக் குறி - விடுகுறி - மேற்படிக்குறி - உடுக்குறி - இணைப்புச் சிறுகோடு - இடைப் பிறவரல் வைப்புக்	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

	குறி - பிறைக்குறி - பகர அடைப்புக்குறி			
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல இலக்கண அறிவின் இன்றியமையாமை - தமிழிலக்கணச் சிறப்பு - நடைமுறை இலக்கணம் கற்றல்	-		

பாட நூல்கள்

- அ.கி. பரந்தாமனார்., (2015), நல்ல தமிழ் எழுத வேண்டுமா? பாரி நிலையம் 184, பிரகாசம் சாலை, சென்னை - 600 108.

பார்வை நூல்கள்

- பேரா கா. பட்டாபிராமன்., (2016), மொழிப் பயன்பாடு, நியூ செஞ்சுரி புக் ஹவுஸ், அம்பத்தூர், சென்னை - 600 098.
- முனைவர் பா.ரா. சுப்பிரமணியன்., முனைவர் வ. ஞானசுந்தரம்., (2004), தமிழ் நடைக் கையேடு, அடையாளம் பதிப்பகம், புத்தாந்தம் - 621 310.

இணையதள முகவரிகள் :

- <https://ta.wikipedia.org/wiki/%E0%AE%A8%E0%AE%BF%E0%AE%B1%E0%AF%81%E0%AE%A4%E0%AF%8D%E0%AE%A4%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AF%81%E0%AE%B1%E0%AE%BF%E0%AE%95%E0%AE%B3%E0%AF%8D>
- <https://www.youtube.com/watch?v=i9sTscRbiTU>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Room.

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் க.ராதிகா

காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

தேசியத்தர நிர்ணயக்குழுவால் 'A' தகுதி பெற்றது

திருச்சிராப்பள்ளி – 18

தமிழாய்வுத்துறை

தன்னாட்சிப் பாடத்திட்டம்



2023 – 2024

முதுகலைத் தமிழிலக்கியம்

இரண்டாம் பருவம்



Cauvery College for Women (Autonomous), Trichy-18
PG & Research Department of Tamil
M.A TAMIL II SEMESTER

LEARNING OUTCOME BASED CURRICULAM FRAME WORK (CBCS -LOCF)

(For the Candidates admitted from the Academic year 2023-2024 onwards)

Sem	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hr s.	Marks		
							Int.	Ext.	
II	Core Course–V (CC)	தொல்காப்பியம் – பொருளதிகாரம் - II (Tholkaappiyam Porulathigaaram - II)	23PTA2CC5	6	5	3	25	75	100
	Core Course –VI (CC)	சித்தர் இலக்கியம் (Siddhar Ilakkiyam)	23PTA2CC6	6	5	3	25	75	100
	Core Course - VII (CC)	காப்பியங்கள் (Kaappiyangal)	23PTA2CC7	6	5	3	25	75	100
	Core Choice Course–I (CCC)	சிற்றிலக்கியம் (Sitrilakkiyam)	23PTA2CCC1A	6	4	3	25	75	100
		B.திருமந்திரம் (ThiruMandhiram)	23PTA2CCC1B						
		C.பாரதியம் (Bharathiyam)	23PTA2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A.ஆராய்ச்சி நெறிமுறைகள் (Aaraaichi Nerimuraigal)	23PTA2DSE2A	6	3	3	25	75	100
		B.கல்வெட்டியல் (Kalvettiyal)	23PTA2DSE2B						
		C.வைணவமும் தமிழும் (Vainavamum Thamizhum)	23PTA2DSE2C						
	Internship	Internship	22PTA2INT	-	2	-	-	100	100

பாடத்திட்டம் – SYLLABUS

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	மெய்ப்பாட்டியல், உவமவியல்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
II	செய்யுளியல் (1-119 நூற்பாக்கள்)	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	செய்யுளியல் (120-235 நூற்பாக்கள்)	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
IV	மரபியல்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
V	பேராசிரியர் உரைத்திறன்	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல தொல்காப்பியச் செய்யுளியல் மற்றும் யாப்பருங்கலக்காரிகை – ஒப்பீடு	-	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5, K6

பாட நூல் :

• பேராசிரியர் (உ.ஆ.), (1951) தொல்காப்பியம் – பொருளதிகாரம், கழக வெளியீடு, சென்னை.

பார்வை நூல்கள் :

• இளம்பூரணர் (உ.ஆ.), (1956) தொல்காப்பியம் – பொருளதிகாரம், கழக வெளியீடு, சென்னை.

• வேங்கடசாமி நாட்டார் (உ.ஆ.), (2010), யாப்பருங்கலக்காரிகை, சாரதா பதிப்பகம், சென்னை.

• கந்தசாமி, சோ. ந., (1989) தமிழ் யாப்பியலின் தோற்றமும் வளர்ச்சியும் தொகுதி 1, 2, தமிழ்ப்பல்கலைக்கழகம், தஞ்சாவூர் – 5.

• வெள்ளைவாரணன், க., (1985) தொல்காப்பியம் உவமையியல் உரைவளம், பதிப்புத்துறை, மதுரை காமராசர் பல்கலைக்கழகம், மதுரை.

• வெள்ளைவாரணன், க., (1986) தொல்காப்பியம் மெய்ப்பாட்டியல் உரைவளம், பதிப்புத்துறை, மதுரை காமராசர் பல்கலைக்கழகம், மதுரை.

• வெள்ளைவாரணன், க., (1989) தொல்காப்பியம் செய்யுளியல் உரைவளம், பதிப்புத்துறை, மதுரை காமராசர் பல்கலைக்கழகம், மதுரை.

• வெள்ளைவாரணன், க., (1994) தொல்காப்பியம் மரபியல் உரைவளம், பதிப்புத்துறை, மதுரை காமராசர் பல்கலைக்கழகம், மதுரை, 1994.

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

Web Resources

<https://www.tamilvu.org/ta/library-l0100-html-l0100ind-116715>

பாடத்திட்டம்

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
1	சித்தர்கள் - பெயர்க்காரணம் - சித்தர்களின் எண்ணிக்கை 18 என்கிற வரையறை - சித்தர்களின் வாழ்க்கைமுறை - இறைக்கொள்கை - உடல், உள்ளம், இறை, உயிர் பற்றிய சிந்தனைகள் - உடற்பயிற்சி, உள்ளப்பயிற்சி, மருத்துவம் முதலான வாழ்வியல் செய்திகள் - சித்தர் பாடல்களில் காணப்படும் சிந்து, கண்ணி முதலான வடிவங்களும் குறியீடு முதலான உத்திகளும்	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
2	1. சிவவாக்கியர் -உயிரும் நன்மையாலுடல் எனத் தொடங்கும் பாடல் முதல் 10 பாடல்கள் (121 - 130) 2. அழகணிச் சித்தர் -புல்லரிடத்திற் போய் எனத் தொடங்கும் பாடல் முதல் 10 பாடல்கள் (31 - 40) 3. கடுவெளிச் சித்தர் - ஆற்றாரும் வீடேற்றங் கண்டு எனத் தொடங்கும் பாடல் முதல் 15 பாடல்கள் (1 - 15) 4. குதம்பைச் சித்தர் - முக்தி நிலைக்கு வழி எனத் தொடங்கும் கண்ணி முதல் 20 கண்ணிகள் (41 - 60)	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
3	1. பாம்பாட்டிச் சித்தர் பொருளாசை விலக்கல் - நாடுநகர் எனத் தொடங்கும் பாடல் முதல் 9 பாடல்கள் (40 - 49) 2.காக புசுண்டர் - சிறந்தபரா பரமாகிய எனத் தொடங்கும் பாடல் முதல் 26 பாடல்கள் (1-26)	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
4	1. காரைச் சித்தர் - மாளாத சக்தியடா எனத் தொடங்கும் பாடல் முதல் 10 பாடல்கள் (1 - 10) 2. பட்டினத்துச் சித்தர் -காணாததைக் கண்டால் எனத் தொடங்கும் பாடல் முதல் 20 பாடல்கள் (31-50)	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

	3. கொங்கணச் சித்தர் - கூடிய பொய்களைச் சொல்லாதே எனத் தொடங்கும் பாடல் முதல் 10 பாடல்கள் (91 - 100)			
5	1.அகப்பேய்ச் சித்தர் -அறிந்து நின்றாலும் எனத் தொடங்கும் பாடல் முதல் 20 பாடல்கள் (31-50) 2.இடைக்காட்டுச் சித்தர்-கண்ணுள் எனத் தொடங்கும் கண்ணி முதல் 30 கண்ணிகள் (47-76) 3.அகத்தியர்-ஞானம்-1 - சத்தியே பராபரமே எனத் தொடங்கும் பாடல் முதல் 9 பாடல்கள் (1-9)	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
6	சுயகற்றல்-(இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல) சித்தர்களின் யோகமார்க்கம்		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

பாட நூல்

- அறிவொளி.அ(உ.ஆ) (2006) சித்தர் பாடல்கள், வர்த்தமானன் பதிப்பகம், சென்னை - 17.

பார்வை நூல்

- நாராயணன்.க (1988) சித்தர் தத்துவம், தமிழ்ப் புத்தகாலயம், திருவல்லிக்கேணி, சென்னை - 600005.
- பசுபதி கே.ஆர் (2003)சித்தர்கள், வ.உ.சி. நூலகம், இராயப்பேட்டை, சென்னை 600014.
- பிரம்மதண்டி ம.சு (2012) சித்தர்களின் வரலாறும் வழிபடும் முறைகளும், தமிழ்ப் புத்தகாலயம், தியாகராய நகர், சென்னை 600017.
- சோமசுந்தரம் மீ.ப. (1998) சித்தர் இலக்கியம், அண்ணாமலைப் பல்கலைக்கழக வெளியீடு, சிதம்பரம்.
- ஜெகதா (தொ.ஆ) (2016) சித்தர்களின் வாழ்வும் வாக்கும், ராமையா பதிப்பகம் சென்னை -

Web Resources

<https://www.maalaimalar.com/devotional/worship/2021/05/06140711/2610896/18-siddhar.vpf>

http://siddarkalvaralaru.blogspot.com/2012/08/blog-post_4263.html

<https://1008petallotus.wordpress.com/2021/03/31/%E0%AE%95%E0%AE%BE%E0%AE%B0%E0%AF%88-%E0%AE%9A%E0%AE%BF%E0%AE%A4%E0%AF%8D%E0%AE%A4%E0%AE%B0%E0%AF%8D-%E0%AE%B5%E0%AE%B0%E0%AE%B2%E0%AE%BE%E0%AE%B1%E0%AF%81/>

<https://www.astroved.com/articles/konganar-siddhar-history-in-tamil>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக் கட்டுரை, கரும்பலகை, குழு விவாதம், PPT, GOOGLE MEET, GOOGLE CLASSROOM, MOOC, SWAYAM, NPTEL, Website etc.

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் அ.யசோதா & முனைவர் தி.மணிமொழி

பாடத்திட்டம் – SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	சிலப்பதிகாரம் மதுரைக்காண்டம் (காடுகாண் காதை முதல் வழக்குரைகாதை வரை 10 காதைகள்)	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
II	மணிமேகலை (ஆபுத்திரன் திறம் அறிவித்த காதை முதல் உதயகுமரனைக் காஞ்சனன் வாளால் எறிந்த காதை வரை 8 காதைகள்) குண்டலகேசி (1 முதல் 19 பாடல்கள்)	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	சீவகசிந்தாமணி - கோவிந்தையார் இலம்பகம் (83 பாடல்கள்) வளையாபதி (1 முதல் 25, 31 முதல் 52 பாடல்கள்)	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
IV	கம்பராமயணம் - மந்தரை சூழ்ச்சிப்படலம் (84 பாடல்கள்) வில்லிபாரதம் - விராடபருவம் - நாடு கரந்துறைச் சருக்கம் (37 பாடல்கள்)	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
V	இயேசு காவியம் - மலைப் பொழிவு முதல் சிதறி விழும் உணவு வரை. சீறாப்புராணம் - புலி வசனித்த படலம்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தோர்விற்கு உரியதல்ல காப்பியங்கள் - தோற்றமும் வளர்ச்சியும் -வகைகள்	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

பார்வை நூல்கள் :

- மாணிக்கவாசகன். ஞா (உ.ஆ), 2010, சிலப்பதிகாரம், உமா பதிப்பகம், சென்னை.
- வேங்கடசாமி (உ.ஆ), 1985, மணிமேகலை, கழக வெளியீடு, சென்னை.
- ராம சுப்பிரமணியம் வ.த (உ.ஆ), 1998, கம்பராமாயணம், திருமகள் பதிப்பகம், மண்ணடி, சென்னை.
- நாராயண வேலுப்பிள்ளை, துரை ராஜாராம், ராம சுப்பிரமணியம் வ.த (உ.ஆ), 2013, வில்லிபாரதம், பூம்புகார் பதிப்பகம், சென்னை.
- சீவக சிந்தாமணி மூலமும் உரையும், 2015, சாரதாபதிப்பகம், சென்னை.
- உமறுப் புலவர், (2010), சீறாப்புராணம், சாரதா பதிப்பகம், சென்னை.
- முனைவர் கமலா முருகன் கே.இரா., 2009, ஐம்பெருங்காப்பியங்கள் - வளையாபதி குண்டலகேசி மூலமும் உரையும், சாரதாபதிப்பகம், சென்னை.
- கவியரசு கண்ணதாசன்., (1982), இயேசு காவியம், கலைக்காவிரி, 49J, பாரதியார் சாலை, திருச்சிராப்பள்ளி.

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Room.

Web Resources

- www.sangatamil.com
- www.tamilvu.org
- www.noolaham.in
- www.projectmadurai.org
- www.chennailibrary.com
- <http://kalithogai.blogspot.in>

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் இர.கீர்த்தனா

பாடத்திட்டம் – SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	சிற்றிலக்கியம் சொல்லாட்சி - சிற்றிலக்கியங்களின் தோற்றம் - வளர்ச்சி - அமைப்பு - பாடுபொருள் - சிற்றிலக்கிய வகைகள் -சிற்றிலக்கியங்களின் சிறப்புகள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
II	தமிழ் விடு தூது-61 முதல் 183 வரை(122 கண்ணிகள்) முக்கூடற்பள்ளு 51 முதல் 94 வரையுள்ள செய்யுட்கள்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	திருக்குற்றாலக் குறவஞ்சி (சிங்கன்-சிங்கி உரையாடல் நீங்கலாக) திருச்செந்தூர் பிள்ளைத் தமிழ் - பருவம் தோறும் முதல் மூன்று பாடல்கள் (30பாடல்கள்)	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
IV	கலிங்கத்துப்பரணி (கடைதிறப்பு நீங்கலாக)	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
V	திருவரங்கக் கலம்பகம் ஏரெழுபது	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல பாட்டியல் நூல்களில் காணலாகும் சிற்றிலக்கிய இலக்கணங்கள்	-		

பார்வை நூல்கள் :

- கதிர்முருகு (உரை),(2018), தமிழ்விடுதாது மூலமும் உரையும், சாரதாபதிப்பகம், சென்னை
- முத்துராம மூர்த்தி(உ.ஆ), (2015), திருக்குற்றாலக்குறவஞ்சி, சாரதாபதிப்பகம், சென்னை
- கதிர்முருகு((உரை),2019, முக்கூடற்பள்ளு மூலமும் உரையும், சாரதா பதிப்பகம் சென்னை
- புலியூர் கேசிகன், (உரை) (2014), கலிங்கத்துப்பரணி, பாரி நிலையம், சென்னை
- சத்திய பாமா காமேஸ்வரன் (பதிப்பாசிரியர்), (2007), பிள்ளைப் பெருமாள் ஐயங்கார், திருவரங்கக் கலம்பகம், சரஸ்வதி நூலகம், தஞ்சை
- கதிர்முருகு (உரை), பகழிக்கூத்தர் திருச்செந்தூர்ப் பிள்ளைத் தமிழ், மூலமும் உரையும், சாரதா பதிப்பகம், சென்னை -14
- கதிர்முருகு (உரை), (2014), கம்பரின் ஏரெழுபது மூலமும் உரையும், சீதை பதிப்பகம், 4ம் பதிப்பு. சென்னை – 5.
- ஜெயராமன்.ந.வீ., (2008), சிற்றிலக்கியத் தோற்றமும் வளர்ச்சியும், சாரதா பதிப்பகம், 4ம் பதிப்பு, சென்னை – 17.
- பொன்னுசாமி.மு, (2004),தமிழ்ச் சிற்றிலக்கிய வரலாறு, இந்து பதிப்பகம், கோயம்புத்தூர்.

இணையதள முகவரிகள் :

- www.tamilvu.org
- www.projectmadurai.org
- <https://www.tamilvu.org/ta/courses-degree-p103-p1033-html-p1033ind-26130>
- <https://www.msuniv.ac.in/Download/Pdf/283a6d3d5d9e464>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Room.

பாடப்பகுதி வடிவமைப்பாளர் :

முனைவர் அ.யசோதா

Semester II	Internal Marks : 25	External Marks : 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
23PTA2CCCIB	திருமந்திரம்	CCC	6	4

நோக்கம் :

- திருமூலரின் வரலாறு மற்றும் திருமந்திரம் பற்றிய அடிப்படை அறிவைப் பெறச்செய்தல்
- நிலையாமை மற்றும் அறத்தின் மேன்மையை உணர்ந்து காயசித்தி உபாயங்களைக் கண்டறிதல்
- திருமந்திரம் வழி வாழ்வியல் நெறிகளை அறிதல்

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive Level
CO1	திருமந்திரத்தில் உள்ள சமூகச் சிந்தனைகளைப் பகுத்தாராய்ந்து திருமூலரின் மொழித் திறனை அறிதல்	K5
CO2	திருமூலரின் இறைக் கொள்கை மற்றும் அறக் கோட்பாடுகளை மதிப்பிடும் திறன் பெறுதல்	K5, K6
CO3	திருமந்திரம் கூறும் வாழ்வியல் விழுமியங்களைப் பகுத்துணர்தல்	K3 K4
CO4	திருமந்திரத்தைக் கற்றுணர்ந்து தனிமனித ஒழுக்கம், ஆளுமைத் திறனில் மேம்படல்	K3
CO5	போட்டித் தேர்வுகளுக்கேற்ற வகையில் திருமந்திரம் குறித்த ஆழ்ந்த அறிவைப் பெறுதல்	K3 K4

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2	3	1	3	4	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3
CO5	2	2	3	2	3	2	2	2	2	3

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	திருமூலர் வரலாறு - திருமந்திரத் தொகைச் சிறப்பு	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
II	யாக்கை நிலையாமை (1-10 பாடல்கள்) செல்வம் நிலையாமை (1-9 பாடல்கள்) இளமை நிலையாமை (1-10 பாடல்கள்) உயிர் நிலையாமை(1-10பாடல்கள்)	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	அறம் செய்வான் திறம் (1-10 பாடல்கள்) அன்புடைமை (1-09 பாடல்கள்) காயசித்தி உபாயம் (1-16 பாடல்கள்) யோகம் (1-10 பாடல்கள்)	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
IV	துறவு (1-10 பாடல்கள்) தவம் (1-08 பாடல்கள்) சிவபூசை (1-23 பாடல்கள்) வாய்மை (1-10 பாடல்கள்)	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
V	முப்பதம் (1-08 பாடல்கள்) அவா அறுத்தல் (1-09 பாடல்கள்) பத்தியுடைமை (1-10 பாடல்கள்) தூல பஞ்சாக்கரம் (1-11 பாடல்கள்) சொருப உதயம்(1-10 பாடல்கள்)	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
VI	சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல முதல் தந்திரம் - கல்வி, நடுவுநிலைமை, கொல்லாமை	-		

பாட நூல் :

- புலவர் அடியன் மணிவாசகன் – 2017, திருமந்திரம், ஐந்தாம் பதிப்பு, சாரதா பதிப்பகம், இராயப்பேட்டை, சென்னை, 600 014

இணையதள முகவரிகள் :

- www.tamilvu.org
- www.noolaham.in
- www.projectmadurai.org

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Room.

பாடப்பகுதி வடிவமைப்பாளர் : முனைவர்.வி கவிதா

பாடத்திட்டம் – SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	பாரதியின் பன்முகக் கவிதைகள் - தேசிய கீதங்கள் - பாரத மாதா திருப்பள்ளி எழுச்சி - தொண்டு செய்யும் அடிமை - சுதந்திர தாகம் - விடுதலை - மகாத்மா காந்தி பஞ்சகம் பக்தி பாடல்கள் - காணி நிலம் வேண்டும் - நல்லதோர் விடுதலை - அன்னையை வேண்டுதல் - காளிப் பாட்டு - முத்து மாரி - நந்தலாலா.	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
II	பாரதியின் பன்முகக் கவிதைகள் ஞானப்பாடல்கள் - சென்றது இனி மீளாது - அறிவே தெய்வம், வசன கவிதை: காற்று.	20	CO1, CO2, CO3, CO4,	K3, K4, K5, K6
III	பாரதியின் கட்டுரைகள் பெண் - தமிழர்நாட்டு நாகரிகம் - தமிழின் நிலை - தேசியக் கல்வி -1, - தமிழருக்கு.	20	CO1, CO2, CO3,	K3, K4, K5,
IV	கதைகள் ஸ்வர்ண குமாரி - மிளகாய்ப்பழச் சாமியார் - காக்காய் பார்லிமெண்ட் - குதிரைக் கொம்பு - புதிய கோணங்கி.	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
V	காவியம் குயில் பாட்டு முழுவதும்	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல பாரதியின் வாழ்க்கை வரலாறு	-	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

பார்வை நூல்கள் :

- பாரதியார், 1981, பாரதியார் கட்டுரைகள், வானதி பதிப்பகம், சென்னை.
- பாரதியார், 2014, பாரதியார் கவிதைகள், மணிவாசகர் பதிப்பகம், சென்னை.
- பாரதியார், 1977, பாரதியார் கதைகள், பூம்புகார் பதிப்பகம். சென்னை.

இணையதள முகவரிகள்:

- <http://www.tamilsurangam.com>
- <https://ta.m.wikibooks.org>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Room.

பாடப்பகுதி வடிவமைப்பாளர் : முனைவர் மு. அனு

பாடத்திட்டம் – SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	ஆய்வும் ஆய்வேடும் – சொல்லும் பொருளும் – வகைகள் - ஆராய்ச்சி – ஒரு விளக்கம் - தமிழில் ஆராய்ச்சி வளர்ச்சி வரலாறு	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
II	ஆய்வாளர்க்குரிய தகுதிகள் - ஆய்பொருள் அல்லது சிக்கல் வினா - ஆய்வைத் திட்டமிட்டுத் தொடங்குதல் - சான்றுமூலம் - தரவுத்தொகுப்பு முயற்சிகள் - நூலகமும் ஆய்வேடும்	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
III	ஆய்வியல் முறைகள் - ஆய்வறிக்கை எழுதும் முறை - தமிழில் மரபுவழி ஆய்வுநெறிகளும் புலப்பாட்டுத் திறனும்	20	CO1 CO2 CO3 CO4	K3 K4 K5 K6
IV	ஆய்வேட்டின் வடிவமைப்பு - அடிக்குறிப்பிடும் முறைகளும் மேற்கோள் காட்டும் நெறிகளும் - சான்று - தரவுத் தொகுப்பு நெறிகள்	15	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
V	குறியீடுகள் – பிழைகளை அகற்றுதல் – ஆய்வுக்குரிய தலைப்புகள் – இருபதாம் நூற்றாண்டுத் தமிழியல் ஆய்வு	15	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல ஆய்வியல் ஆற்றுப்படை – ஆய்பொருள் தலைப்புகள்	-		

பாட நூல்கள் :

- டாக்டர் தமிழண்ணல்., டாக்டர் எம்.எஸ்.இலக்குமணன் ., 1977 ஆய்வியல் அறிமுகம் மதுரை மீனாட்சி புத்தக நிலையம் மதுரை.

பார்வை நூல்கள் :

- பாலசுப்பிரமணியன் கு.வெ., (2014), ஆய்வியல் நெறிகள், உமா நூல் வெளியீட்டகம், தஞ்சாவூர்
- டாக்டர் விஸ்வநாதன், (1966), ஆய்வு நெறிமுறைகள், தமிழ்ப்புத்தகாலயம், சென்னை
- டாக்டர் பொற்கோ, (2005), ஆராய்ச்சி நெறிமுறைகள், ஐந்திணைப் பதிப்பகம், சென்னை
- டாக்டர் வே. சிதம்பரநாதன், (1988), ஆய்வியல் முறைகள், சுபா பதிப்பகம், நாகர்கோயில்

இணையதள முகவரிகள் :

- www.tamilvu.org
- www.noolaham.in
- www.projectmadurai.org
- www.chennailibrary.com
- <http://kalithogai.blogspot.in>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Room.

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் இர. கீர்த்தனா

Semester II	Internal Marks : 25	External Mark 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
23PTA2DSE2B	கல்வெட்டியல்	DSE	6	3

நோக்கம் :

- கல்வெட்டுகளின் வழி வரலாற்றைக் கற்பித்தல்.
- பழந்தமிழரின் மொழிப்புலத்தைப் பயிற்றுவித்தல்.
- கல்வெட்டுகளின் மூலம் காலத்தைக் கண்டறியச்செய்தல்

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive gLevel
CO1	கல்வெட்டுகளை மதிப்பிட்டு அவற்றை வகைப்படுத்தி அறிதல்	K4, K6
CO2	கல்வெட்டுகளில் உள்ள கோட்பாடுகளைப் பகுத்தாய்தல்	K5
CO3	கல்வெட்டுகளில் உள்ள வாழ்வியல் விழுமியங்களைப் பகுத்துணர்ந்து மனிதகுல மேம்பாட்டிற்குப் பயன்படுத்துதல்	K5, K6
CO4	கல்வெட்டுகளை ஆராய்ந்து விமர்சிக்கும் திறன் பெறுதல்	K3 K4
CO5	போட்டித் தேர்வுகளுக்கேற்ற வகையில் கல்வெட்டுகளை ஆய்ந்தறிதல்	K3 K4

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2	3	1	3	3	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3
CO5	2	2	3	2	3	2	2	2	2	3

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	கல்வெட்டியல் - ஓர் அறிமுகம் - எழுத்துக்களின் தோற்றம் - எழுத்துக்களின் வகைகள் - எழுதுபொருட்கள் - குறியீடுகளும் எழுத்துக்களும்.	15	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
II	தமிழ் அறிமுகம் - தமிழ் கல்வெட்டுக்கள் - வட்டெழுத்துக்கள் - அறிமுகம் - வளர்ச்சி - நடுகற்கள் - கிரந்தம்	15	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
III	தமிழ் கல்வெட்டுக்கள் அறிமுகம் - கல்வெட்டுகளின் அமைப்பு - எழுத்தமைதி அடிப்படையில் காலம்.	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
IV	கல்வெட்டுகளில் காலக்கணிப்பு முறைகள் கல்வெட்டுகளும் இலக்கியமும் செப்பேடுகள் அமைப்பு- செப்பேடு பதிப்பித்தலில் அணுகுமுறை - மெய்க்கீர்த்தி - ஓலையும் கல்வெட்டும்.	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
V	வரலாற்று உருவாக்கத்திற்கு கல்வெட்டுகளின் பங்களிப்பு - சமூகம் -சமயம்- பொருளாதாரம்	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல கல்வெட்டுகளை ஆராய்ந்து படியெடுத்தல் பயிற்சி	-		

பாட நூல்:

- ராஜன்.கா, (1995) கல்வெட்டியல், மனோ பதிப்பகம், சென்னை.

பார்வை நூல்கள் :

- முனைவர் எ.சுப்பராயலு, முனைவர் செ.இராசு (ப.ஆ), (1998) தமிழ்க் கல்வெட்டியலும் வரலாறும், தமிழ்ப் பல்கலைக்கழகம் வெளியீடு, தஞ்சாவூர்.
- வித்துவான் திரு.வை.சுந்தரேசவாண்டையார், (1986) கல்வெட்டு, பொதிகை பதிப்பகம், சீதாராமநகர், கடலூர்.

இணையதள முகவரிகள்

- https://ta.m.wikipedia.org/wiki/%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AF%8D%E0%AE%95%E0%AF%8D_%E0%AE%95%E0%AE%B2%E0%AF%8D%E0%AE%B5%E0%AF%86%E0%AE%9F%E0%AF%8D%E0%AE%9F%E0%AF%81%E0%AE%95%E0%AE%B3%E0%AF%8D
- <https://m.facebook.com/tamiltamilartonmam/posts/2995372860540096>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Room.

பாடப்பகுதி வடிவமைப்பாளர் : முனைவர் வி.கவிதா

Semester II	Internal Marks : 25	External Mark 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
23PTA2DSE2C	வைணவமும் தமிழும்	DSE	6	3

நோக்கம்

- தொல்காப்பியர் காலம் முதல் காணப்படும் வைணவச் சிந்தனை, இலக்கிய வகைமையைப் பகுத்தறிதல்.
- தமிழ் மொழிக்கு வைணவத்தின் அருங் கொடையினைக் கண்டறிதல்.
- வைணவ இலக்கியங்களின் வழி வாழ்வியல் நெறிகளை அறிதல்.

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive gLevel
CO1	வைணவ இலக்கியங்களை மதிப்பிட்டு அன்றைய சமூகச் சிந்தனைகள் மற்றும் மொழித்திறனை வகைப்படுத்தி அறிதல்	K4 K6
CO2	வைணவ இலக்கியங்களில் உள்ள கொள்கை, கோட்பாடுகளைப் பகுத்தாய்தல்	K5
CO3	வைணவ இலக்கியங்களில் உள்ள வாழ்வியல் விழுமியங்களைப் பகுத்துணர்ந்து மனிதகுல மேம்பாட்டிற்குப் பயன்படுத்துதல்	K5 K6
CO4	வைணவ இலக்கியங்களின் தனித்தன்மையை ஆராய்ந்து விமர்சிக்கும் திறன் பெறுதல்	K3 K4
CO5	போட்டித் தேர்வுகளுக்கேற்ற வகையில் வைணவ இலக்கியங்கள், உரைகள் ஆகியவற்றை ஆய்ந்தறிதல்	K3 K4

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2	3	1	3	3	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3
CO5	2	2	3	2	3	2	2	2	2	3

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	வைணவம் – விளக்கம் – தமிழ் நாட்டில் வைணவம் வளர்ந்த வரலாறு, பரிபாடல், சிலம்பில் இடம்பெறும் வைணவக் குறிப்புகள்.	15	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
II	பன்னிரு ஆழ்வார்கள் – வரலாறு	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
III	வைணவ இலக்கிய உரையாசிரியர்கள் மற்றும் உரைகளின் சிறப்புகள்	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
IV	நாலாயிர திவ்யப் பிரபந்தம் – சிறப்புகள், தொகுப்பு நெறிமுறைகள்	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6

V	கம்பராமாயணம் – வில்லிபாரதம் – காப்பியப் பெருமைகள்	15	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல திருப்பாவை	-		

பார்வை நூல்கள் :

- சுப்புரெட்டியார்.ந.(1995).வைணவ சமயம். தமிழ்ப்பல்கலைக்கழகம், தஞ்சாவூர்.
- இலட்சுமணன். கி,(2013), இந்திய தத்துவ ஞானம், பதினோராம் பதிப்பு, பழனியப்பா பிரதர்ஸ் சென்னை 14.
- சுப்புரெட்டியார். ந, (1988) சிலநோக்கில் நாலாயிரம்,பாரிநிலையம், சென்னை -108.
- சென்ட்ரல் சின்மயா மிஷன் , (மறுபதிப்பு -2003) கம்பர், சென்னை -31.

இணையதள முகவரிகள்

- <https://www.tamilvu.org/ta/courses-degree-a041-a0412-html-a0412225-8201>
- https://m-tamil.webdunia.com/religion/religion/article/0705/21/1070521017_1.htm?amp=1
- <http://keetru.com/index.php/2009-10-07-10-44-25/2011-sp-41283151/17598-2011-11-30-03-20-32>
- <https://hindumatham.in/h4>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Room.

பாடப்பகுதி வடிவமைப்பாளர் : முனைவர் ந.சுபா

காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

தேசியத்தர நிர்ணயக்குழுவால் 'A' தகுதி பெற்றது

திருச்சிராப்பள்ளி – 18

தமிழாய்வுத்துறை

தன்னாட்சிப் பாடத்திட்டம்



2022 – 2023

முதுகலைத் தமிழிலக்கியம்

நான்காம் பருவம்



Cauvery College for Women (Autonomous), Trichy-18

PG & Research Department of Tamil

M.A TAMIL

LEARNING OUTCOME BASED CURRICULAM FRAME WORK (CBCS -LOCF)

(For the Candidates admitted from the Academic year 2022-2023 onwards)

IV SEMESTER

Sem	Course	Course Title	Course Code	Inst.	Hrs.	Credits	Exam			Total
							Hrs.	Marks		
								Int.	Ext.	
IV	Core Course-XI (CC)	தொல்காப்பியம்- பொருளதிகாரம் பின் நான்கு இயல்கள்(இளம்பூரணர் உரை) (Tholkaappiyam - Porulathigaaram pinnaangu iyalgal - Ilampooranar urai)	22PTA4CC11	6	5	3	25	75	100	
	Core Course - XII (CC)	சங்கஇலக்கியம்-பத்துப்பாட்டு (Sanga Ilakkiyam-Pathupaattu)	22PTA4CC12	6	5	3	25	75	100	
	Core Choice Course- III(CCC)	A.நாட்டுப்புற இலக்கியங்கள் (Naattupura Ilakkiyangal)	22PTA4CCC3A	6	4	3	25	75	100	
		B.மொழிபெயர்ப்பு இலக்கியங்கள் (Mozhipeyarppu Ilakkiyangal)	22PTA4CCC3B							
		C.தமிழின்செம்மொழி பண்புகள் (Thamizhin Semmozhi Panbugal)	22PTA4CCC3C							
	eneric Elective Course-II(GEC)	சித்தமருத்துவம்(Siddha Maruthuvam)	22PTA4GEC2	3	2	3	25	75	100	
	Project	Project Work	22PTA4PW	9	5	-	-	100	100	
Total				30	21	-	-	-	500	
Grand Total				120	92	-	-	-	2200	

பாடத்திட்டம் – SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	மெய்ப்பாட்டியல்	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
II	உவமையியல்	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
III	செய்யுளியல் (1-156 நூற்பாக்கள்)	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
IV	செய்யுளியல் (157-235 நூற்பாக்கள்)	20	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
V	மரபியல்	10	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தோர்விற்கு உரியதல்ல தொல்காப்பிய உவமையியல் மற்றும் தண்டியலங்காரம் - ஒப்பீடு	-		

பாட நூல் :

- இளம்பூரணர் (உ.ஆ.), (1956), தொல்காப்பியம் – பொருளதிகாரம், கழக வெளியீடு, சென்னை.

பார்வை நூல் :

- பேராசிரியர் (உ.ஆ.), (1951), தொல்காப்பியம் – பொருளதிகாரம், கழக வெளியீடு, சென்னை.
- இராமலிங்கத் தம்பிரான், கொ. (உ.ஆ.), (1938), தண்டியலங்காரம், கழக வெளியீடு, சென்னை.
- சோ. ந. கந்தசாமி, (1989), தமிழ் யாப்பியலின் தோற்றமும் வளர்ச்சியும் தொகுதி 1, 2, தமிழ்ப்பல்கலைக்கழகம், தஞ்சாவூர் – 5.
- வெள்ளைவாரணன், க., (1985) தொல்காப்பியம் உவமையியல் உரைவளம், பதிப்புத்துறை, மதுரை காமராசர் பல்கலைக்கழகம், மதுரை.
- வெள்ளைவாரணன், க., (1986) தொல்காப்பியம் மெய்ப்பாட்டியல் உரைவளம், பதிப்புத்துறை, மதுரை காமராசர் பல்கலைக்கழகம், மதுரை.
- வெள்ளைவாரணன், க., (1989) தொல்காப்பியம் செய்யுளியல் உரைவளம், பதிப்புத்துறை, மதுரை காமராசர் பல்கலைக்கழகம், மதுரை.
- வெள்ளைவாரணன், க., (1994) தொல்காப்பியம் மரபியல் உரைவளம், பதிப்புத்துறை, மதுரை காமராசர் பல்கலைக்கழகம், மதுரை, 1994.

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

Web Resources

<https://www.tamilvu.org/ta/library-I0100-html-I0100ind-116715>

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	திருமுருகாற்றுப்படை	18	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
II	பொருநராற்றுப்படை	18	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
III	முல்லைப்பாட்டு , நெடுநல்வாடை	18	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
IV	குறிஞ்சிப்பாட்டு	18	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
V	பட்டினப்பாலை	18	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6

VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல பதிப்பு முயற்சிகள்	-	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6

பார்வை நூல்கள்

- 1 சாமிநாதையர் உ .வே. (உ.ஆ.), 2018, பத்துப்பாட்டு மூலமும் நச்சினார்க்கினியர் உரையும், டாக்டர் உ .வே. சாமிநாதையர் நூல் நிலையம்
2. இராச மாணிக்கனார்.மா, 2018, பத்துப்பாட்டு ஆராய்ச்சி, சாகித்ய அகாடமி வெளியீடு,சென்னை
3. சோமசுந்தரனார். பொ.வே. (உ.ஆ.),2016, பத்துப்பாட்டு மூலமும் உரையும் ,திருநெல்வேலி சைவ சித்தாந்த நூல் பதிப்புக் கழகம், சென்னை

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம் ,PPT,GOOGLE MEET,GOOGLE CLASS ROOM

Web Resources

<https://tamilebooks.org/ebooks/%E0%AE%A8%E0%AE%B1%E0%AF%8D%E0%AE%B1%E0%AE%BF%E0%AE%A3%E0%AF%88-ebook/>
<https://www.google.com/search?q=kurunthogai+pdf&oq=KURUNTHO&aqs=chrome..3.69i57j35i39j46i39j0i67i650j0i512l6.8718j0j7&sourceid=chrome&ie=UTF-8>
<https://www.tamilvu.org/library/nationalized/scholars/pdf/others/tcl/ainkurunuru.pdf>
<https://www.chennailibrary.com/ettuthogai/kalithogai.html>
<https://www.tamilvu.org/library/nationalized/pdf/59-puliyurkesigan/010.purananuru.pdf>

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் ந.சுபா

பாடத்திட்டம்

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
1	நாட்டுப்புறவியல் வரலாறு – தமிழக நாட்டுப்புறவியல் வரலாறு – நாட்டுப்புறவியல் கல்வி – நாட்டுப்புறவியல் பள்ளிகள்	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
2	நாட்டுப்புற இலக்கியமும் எழுத்திலக்கியமும் - பழமொழிகள் – விடுகதைகள் - நாட்டுப்புற மருத்துவம்	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
3	நாட்டுப்புறக் கதைப்பாடல்கள் - நாட்டுப்புறக் கூத்துகள் - (வானமாமலை – கதைப்பாடல் திரட்டு) கட்டபொம்மு கூத்து	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
4	நாடோடிப் பாடல்களின் தோற்றமும் இயல்பும் – நாடோடிப் பாடல்களின் சிறப்பியல்புகள் – (கி.வா.ஜகந்நாதன் – மலையருவி) தொழிலாளர் பாட்டு - சுண்ணாம்பு குத்தும் பாட்டு - கப்பல் ஏறினவன் - விளைந்த கதிர் - விறகொடிக்கும் பெண் - எங்கும் நெல் குடும்பம் - கல்யாணப்பாட்டு தாலாட்டு - ஆர் அடித்தார் - மீன் பாட்டு - வேட்டை	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

	• அறுவடை • உபதேசம் • கதம்பம் • நோயும் மருந்தும் • வீடு கட்டின கதை • தூங்கு • தாயின் கதை பல கதம்பம் • தாது வருஷ பஞ்சம் • வெள்ளைக்காரன் பாட்டு			
5	நாட்டுப்புற நம்பிக்கைகள் – நாட்டுப்புறப் பழக்க வழக்கங்கள் - நாட்டுப்புற விளையாட்டுகள் – நாட்டுப்புறக் கலைகள்	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
6	சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல நாட்டுப்புறக் கதைகள் விளக்கம் - வகைப்பாடுகள் - நாட்டுப்புற கதைகள்		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

பாட நூல்கள்

- டாக்டர் சக்திவேல் சு., (2006), நாட்டுப்புறவியல் ஆய்வு, மணிவாசகர் பதிப்பகம் , பாரிமுனை சென்னை - 108
- டாக்டர் சண்முகசுந்தரம் சு., (1999) நாட்டுப்புற இயல், மணிவாசகர் பதிப்பகம் , பாரிமுனை சென்னை – 108
- வானமாமலை நா., (2017), கதைப்பாடல் களஞ்சியம், நாம் தமிழர் பதிப்பகம், சென்னை - 14.
- ஜகந்தாதன் கி.வா., (2021), மலையருவி, சாரதா பதிப்பகம், சென்னை -14.
- பெருமாள் அ.கா.. (2009) நாட்டுப்புற கதைகள். ஸ்ரீசெண்பகா பதிப்பகம், சென்னை

பார்வை நூல்கள்

- டாக்டர் இராமநாதன் ஆ., (1987) நாட்டுப்புற இயல் மணிவாசகர் பதிப்பகம் 8/7 சிங்கர் தெரு, பாரிமுனை, சென்னை 600108.

- டாக்டர் லுர்து தே., (2011) நாட்டார் வழக்காற்றியல் சில அடிப்படைகள், நாட்டார் வழக்காற்றியல் ஆய்வு மையம், தூய சவேரியர் (தன்னாட்சி) கல்லூரி, பாளையங்கோட்டை 627002
- பெருமாள் ஏ.என்., நாட்டுப்புறகலைகள், உலகத்தமிழாராய்ச்சி நிறுவனம் வெளியீடு சென்னை,
- மருதுரை அரு., (1987) நாட்டுப்புற வாழ்வியல், அருணா வெளியீடு, முசிறி, 1995
- அழகப்பன் ஆறு., (1991) நாட்டுப்புறவியல் ஆய்வு முறைகள் – தமிழ்ப்பல்கலைக்கழகம், தஞ்சாவூர்,
- சண்முகசுந்தரம் சு., (1976) நாட்டுப்புற இலக்கியத்தின் செல்வாக்கு, இலக்கிய மாணவர் வெளியீடு, சென்னை,
- இராமநாதன் ஆறு. (1987) நாட்டுப்புற கதைக்களஞ்சியம் (தொகுதிகள்) மணிவாசகர் பதிப்பகம், சிதம்பரம்,

WEB SOURCE

- <https://www.tamilvu.org/library/nationalized/html/naauthor-84.htm>
- <https://www.tamildigitallibrary.in/book-detail?id=jZY9lup2kZl6TuXGIZQdjZp8k0My&tag=%E0%AE%AE%E0%AE%B2%E0%AF%88%E0%AE%AF%E0%AE%B0%E0%AF%81%E0%AE%B5%E0%AE%BF#book1/>
- <https://www.tamildigitallibrary.in/book-detail?id=jZY9lup2kZl6TuXGIZQdjZp3kJM6&tag=%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AF%8D%20%E0%AE%A8%E0%AE%BE%E0%AE%9F%E0%AF%8D%E0%AE%9F%E0%AF%81%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AF%81%E0%AE%B1%20%E0%AE%87%E0%AE%AF%E0%AE%B2%E0%AF%8D%20%E0%AE%86%E0%AE%AF%E0%AF%8D%E0%AE%B5%E0%AF%81#book1/>
- <https://tamilarangam.in/%e0%ae%95%e0%af%8a%e0%ae%99%e0%af%8d%e0%ae%95%e0%af%81-%e0%ae%a8%e0%ae%be%e0%ae%9f%e0%af%8d%e0%ae%9f%e0%af%81-%e0%ae%95%e0%ae%be%e0%ae%aa%e0%af%8d%e0%ae%aa%e0%ae%bf%e0%ae%af%e0%ae%99%e0%af%8d%e0%ae%95/>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக் கட்டுரை, கரும்பலகை, குழு விவாதம், PPT. GOOGLE MEET, GOOGLE CLASSROOM, MOOC, SWAYAM, NPTEL, Website etc.

பாடத்திட்ட வடிவமைப்பாளர்

முனைவர் வி.சத்யவதி

பாடத்திட்டம்- SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	மொழிபெயர்ப்பு பொருள்விளக்கம் – மொழிபெயர்ப்பின் நோக்கம் - மொழிபெயர்ப்பின்வகைகள்	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	கவிதை- உமர்கய்யாம்பாடல்கள்	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	நாவல் -செம்மீன்	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	சிறுகதை - சின்னச்சின்னபூகம்பங்கள்	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	மொழிபெயர்ப்பு நாடகம் - நடுக்கடலில்	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	சுயகற்றல் - இப்பகுதிபருவத்தேர்விற்குஉரியதல்ல கலைச்சொல்லாக்கம்	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

பாடநூல்கள்

- சு.சண்முகவேலாயுதம்,(2008),மொழிபெயர்ப்பியல், உலகத்தமிழ்ஆராய்ச்சிநிறுவனம். சென்னை 600013.
- மு. வளர்மதி, 1999, மொழிபெயர்ப்புக்கலைதிருமகள்நிலையம்,சென்னை 17.
- கவிமணிதேசிகவிநாயகம், 2008, உமர்கய்யாம்பாடல்கள்,சாரதாபதிப்பகம் சென்னை.22
- தகழிசிவசங்கரப்பிள்ளை, (1956) செம்மீன்,மலையாளம், நேஷனல்புக்ஸ்டால்,
- நர்மதாசுப்பிரசாமி,(2012),சின்னச்சின்னபூகம்பங்கள்,சிறுகதை,அகநாழிகைபதிப்பகம். செப்டம்பர்.17
- வெளி ரங்கராஜன் , (2021), நடுக்கடலில் ,மொழிபெயர்ப்பு நாடகங்கள், தமிழ் வெளிவெளியீடு.

பார்வைநூல்கள்

- பெ. செல்வகுமார், (2007), மொழிபெயர்ப்பியல்பார்க்கர் சென்னை.14
- சி. சண்முகம்&வே. தயாளன் (1989)மொழிபெயர்ப்பியல்அகரம்கும்பகோணம்.
- சேதுமணிமணியன், (1990), மொழிபெயர்ப்பியல், கோட்பாடுகளும்உத்திகளும், செண்பகம்வெளியீடு மதுரை.6
- வீ.சந்திரன், (2003), மொழிபெயர்ப்பியல்அணுகுமுறைகள்,அமுதநிலையம், சென்னை.14.
- சு.சண்முகவேலாயுதம்(1985)மொழிபெயர்ப்பியல்,உலகத்தமிழ்ஆராய்ச்சிநிறுவனம்,

சென்னை. 600113

இணையதளமுகவரி

- <https://www.tamilvu.org/courses/degree/p201/p2011/html/p2011ind.ht>
- https://oms.bdu.ac.in/ec/admin/contents/371_P16TAE5B_2020051909044114.pdf

கற்பித்தல்முறைகள் கலந்தாய்வு, வினாடிவினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT. GOOGLE MEET, GOOGLE CLASSROOM, MOOC, SWAYAM, NPTEL, Website etc பாடத்திட்டவடிவமைப்பாளர்

முனைவர் பா. கவிதா

Semester IV	Internal Mark: 25	External Mark: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22PTA4CCC3C	தமிழின் செம்மொழிப் பண்புகள்	CCC	6	4

நோக்கம்

தமிழின் தொன்மை, சிறப்பு, இலக்கியச் செழுமையை மாணவர்களுக்குக் கற்பித்தல்
செவ்வியல் இலக்கியங்களின் தனித்தன்மைகளை எடுத்துரைத்தல்.
தமிழ்ச் செம்மொழியின் பண்புகளை உணரச் செய்தல்

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Knowledge Level
CO1	மொழியின் அடிப்படைக் கூறுகளைப் பகுத்தாராய்தல்	K1
CO2	மொழியின் தனித்தன்மைகள்,கோட்பாடுகளைப் பகுத்தாராய்தல்	K2
CO3	செம்மொழி இலக்கியங்களின் வாயிலாக வாழ்வியல் விழுமியங்களை அறிந்து வாழ்விற்குப் பயன்படும் வகையில் கற்றல்	K3
CO4	மொழியின் வளர்ச்சிக்குரிய திட்டங்களைக் கண்டறிந்து புதிய சிந்தனைகளைப் பெறுதல்.	K2
CO5	போட்டித் தேர்வுகளுக்கேற்ற வகையில் செம்மொழிப் பண்புகள் குறித்த ஆழ்ந்த அறிவைப் பெறுதல்	K3

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	2	3	3	2	3	3	2	3	3
CO4	3	1	3	3	2	3	3	3	3	3
CO5	3	1	2	3	3	3	3	3	3	3

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	மொழி – மொழியின் தோற்றம் – மொழி பற்றிய விளக்கம் - மொழிக்குடும்பங்கள் – உலகச்செம்மொழிகள்.	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
II	இந்தியச் செம்மொழிகள் – செம்மொழியின் தகுதிகள் – செம்மொழியின் வரையறைகள் – செம்மொழியின் பண்புகள்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	தமிழின் தொன்மை – சிறப்புகள் தனித்தன்மைகள் – தாய்மொழிப் பாதுகாப்பின் இன்றியமையாமை	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
IV	தமிழ்ச் செம்மொழி நூல்கள் - தொல்காப்பியம் எட்டுத்தொகை – பத்துப்பாட்டு – பதினெண்கீழ்க்கணக்கு – சிலப்பதிகாரம் - மணிமேகலை – இறையனார் களவியல் – முத்தொள்ளாயிரம் இவற்றின் சிறப்புகள்.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
V	தமிழ் வளர்ச்சிக்கு அறிஞர்களின் பங்களிப்பு. கால்டுவெல் முதல் கலைஞர் வரை – தமிழ் இயக்கங்கள் – மாநாடுகளின் பங்களிப்பு	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல திருந்திய மொழிகள் – திருந்தா மொழிகள்	-		

பாட நூல்:

1. முனைவர் பாக்யமேரி, (2012), தமிழ்ச் செம்மொழி வரலாறு, பூவேந்தன் பதிப்பகம், மயிலாப்பூர், சென்னை.

பார்வை நூல்கள்:

1. முனைவர் மு. சாதிக்பாட்சா, (2015), தமிழ்ச்செம்மொழி வரலாறு, ராஜா பப்ளிகேஷன்ஸ் 21, ரேஸ்கோர்ஸ் ரோடு, காஜாநகர், திருச்சி
2. முனைவர் கி. ஆதிநாராயணன், (2013), உலகச்செம்மொழிகள், பாரி புத்தகப்பண்ணை, 88, பிராட்வே, சென்னை - 600104
3. முனைவர் மு. சாதிக்பாட்சா, (2019), தமிழ்ச் செம்மொழி பண்புகள், இராஜா வெளியீடு 10, மேல்தளம், இப்ராஹிம் நகர், காஜாமலை, திருச்சி – 23

இணையதள முகவரி

<https://yarl.com/forum3/topic/148125->

[%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AE%BF%E0%AE%A9%E0%AF%8D-](https://yarl.com/forum3/topic/148125-%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AE%BF%E0%AE%A9%E0%AF%8D-%E0%AE%9A%E0%AF%86%E0%AE%AE%E0%AF%8D%E0%AE%AE%E0%AF%8A%E0%AE%B4%E0%AE%BF%E0%AE%AA%E0%AF%8D-%E0%AE%AA%E0%AE%A3%E0%AF%8D%E0%AE%AA%E0%AF%81%E0%AE%95%E0%AE%B3%E0%AF%8D/)

[%E0%AE%9A%E0%AF%86%E0%AE%AE%E0%AF%8D%E0%AE%AE%E0%AF%8A%E0%AE%B4%E0%AE%BF%E0%AE%AA%E0%AF%8D-%E0%AE%AA%E0%AE%A3%E0%AF%8D%E0%AE%AA%E0%AF%81%E0%AE%95%E0%AE%B3%E0%AF%8D/](https://yarl.com/forum3/topic/148125-%E0%AE%9A%E0%AF%86%E0%AE%AE%E0%AF%8D%E0%AE%AE%E0%AF%8A%E0%AE%B4%E0%AE%BF%E0%AE%AA%E0%AF%8D-%E0%AE%AA%E0%AE%A3%E0%AF%8D%E0%AE%AA%E0%AF%81%E0%AE%95%E0%AE%B3%E0%AF%8D/)

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்
பாடத்திட்ட வடிவமைப்பாளர்
முனைவர் மு.ஜெயலெட்சுமி

பாடத்திட்டம் – SYLLABUS				
UNIT	CONTENT	HOUR S	COs	COGNITIVE LEVEL
I	மூலிகை மருத்துவம் விளக்கம்- திருக்குறளில் காணப்பெறும் மருத்துவ தொடர்பான செய்திகள்- மருத்துவ பழமொழிகள் -சித்த மருத்துவஅறிமுகம் - சித்த மருத்துவ வரலாறு- சித்த மருத்துவப் பாடல்கள் அறிமுகம்	9	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
II	மூலிகை மருத்துவத்திற்குரிய அடிப்படைகள்- மூலிகை வகைகள்- மூலிகைகளைக் கண்டறிதல் வளர்த்தல்	9	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
III	அறுகு முதல் வேம்பு வரை குறிப்பிட்ட மூலிகைகளின் மருத்துவ குணங்கள்- மருந்தாகும் மரங்கள் .	9	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
IV	மூலிகைத் தோட்டம் அமைத்தல் - மூலிகை வளர்ப்பு முறைகள்	9	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
V	சூரணம்- லேகியம்- பஸ்பம் -தைலம் முதலான மருந்துகளில் மூலிகைகளின் பயன்பாடு--அறிமுகம்-மூலிகைப் பொருள்களுக்கான விற்பனை வாய்ப்புகள்	9	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6

VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல உடல்நலத்திற்கும் மனநலத்திற்கும் தேவையான மருத்துவகுணம் நிறைந்த மூலிகைகளை ஆராய்ந்தறிதல்	-	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6

பாட நூல்

சு.திருஞானம்., (2019) மூலிகை மருத்துவம்., செல்வி பதிப்பகம்., திருச்சிராப்பள்ளி – 620 023

இணையதள முகவரிகள் :

<https://www.amazon.in/%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AF%8D-%E0%AE%AE%E0%AF%82%E0%AE%B2%E0%AE%BF%E0%AE%95%E0%AF%88-%E0%AE%AE%E0%AE%B0%E0%AF%81%E0%AE%A4%E0%AF%8D%E0%AE%A4%E0%AF%81%E0%AE%B5%E0%AE%AE%E0%AF%8D-Tamil-Kumaresan-ebook/dp/B08MY2Z7XY>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், PPT, Google Meet, Google Class Room.

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் அ.இரா.கோமதி

ANNEXURE B

(Poetry, Grammar and History of Sanskrit Literature)

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
23ULS1	Core	Y	Y	-	-	3	6	25	75	100
Learning Objectives										
LO1	To help the students learn the alphabets of Sanskrit.									
LO2	To understand the Sanskrit grammar and sabdas.									
LO3	To have an idea of the epics.									
LO4	To closely understand the literary works in Sanskrit with special reference to Panchamahakavyas.									
LO5	To understand the Raghuvamsa Mahakavya and Kalidasa.									
UNIT	Details									
I	Introduction to Sanskrit (Alphabets, Two letter words and three letter words) Grammar: <i>akārāntaḥpumlingaḥśabda-s</i> - 1. बाल (Bāla) and 2. देवे (Deva) <i>ākārāntaḥstrīlingaḥśabda-s</i> - 1. बाला (Bālā) and 2. लता (Latā) <i>akārāntaḥnapumsakalingaḥśabda-s</i> - 1. फल (Phala) and 2. वन (Vana)									
II	Introduction to <i>Rāmāyana</i> , <i>Kālidāsa</i> and his poetic works Text: <i>Raghuvamśa</i> (Canto I) Verses 1-15									
III	Introduction to the works of <i>Bhāravi</i> - Text: <i>Raghuvamśa</i> (canto I) Verses 16-30									
IV	Introduction to the works of <i>ŚrīHarṣa</i> - Text: <i>Raghuvamśa</i> (Canto I) Verses 31-45									
V	Grammar: Conjugations - <i>Laṭlakāra-s</i> – (Present tense) (i) गच्छति (Gacchati) (ii) तिष्ठति (Tiṣṭhati) (iii) पठति (Paṭhati) (iv) नृत्यति (Nr̥tyati) (v) कुप्यति (Kupyati) (vi) कथयति (Kathayati) (vii) गणयति (Gaṇayati) (viii) अस्ति (Asti) (ix) करोति (Karoti) (x) शृणोति (Śṛṇoti) Indeclinables (Avyayaani) - अपि (api), कदा (kadā), च (ca), अद्य (adya), विना (vinā), सह (saha), तत्र (tatra), किम् (kim), यदि (yadi) - तर्हि (tarhi), यथा (yathā) - तथा (tathā) Prefixes (Upasargas) - आङ् (āñ), वि (vi), परि (pari), अनु (anu), अति (adhi), उत् (ut), प्रति (prati), उप (upa), प्र (pra) निर् (nir)									
Course Outcomes										
Course Outcomes	On completion of this course, students will;									

CO1	Remember the usage of grammatical tenses in constructing sentences in dialogue.	PO1
CO2	Apply the rules of usage in practice exercises and identify errors	PO1, PO2
CO3	Explain the usage of various grammatical tenses and aspects	PO4, PO6
CO4	Demonstrate knowledge of various expressions of opinion, emotions, cause, effect, purpose, and hypothesis in Sanskrit.	PO4, PO5, PO6
CO5	Communicate in Sanskrit and summarize the given text	PO3, PO8
TextBooks(Latest Editions)		
1.	Kalasala Samskrita Sukha Bodhini I (for under graduate foundation course)Published by University of Madras, Chennai-5	
ReferencesBooks and WebResources		
1.	https://archive.org/details/raghuvamsha_with_sanjivini_edited_by_mr_kale	
2.	https://archive.org/details/AShortHistoryOfsanskritLiterature	

Question Paper Pattern	
Section A – One mark Questions 20 x 1 = 20 Marks	
Section B – Answer in a paragraph(either or type) 5 x 5 = 25 Marks	
Section C – Answer any 3 out of 5 Questions. 3x10=30 Marks	

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0
CO 1	3	3	3	3	3	3	3	2	3	2
CO 2	2	3	3	3	2	3	3	2	2	2
CO 3	3	3	3	2	3	3	3	2	3	2
CO 4	3	3	3	3	3	3	3	2	2	2
CO 5	3	2	3	3	3	3	3	2	2	3

3 – Strong, 2 – Medium , 1 - Low

Mapping with Programme Specific Outcomes:

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

FIRST YEAR - SEMESTER II
Sanskrit Paper II
(Prose, Grammar and History of Sanskrit Literature)

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
23ULS2	Core	Y	Y	-	-	3	6	25	75	100
Learning Objectives										
LO1	To understand prose literature in Sanskrit									
LO2	To understand the Sanskrit grammar and ekaranta pulinga sabdas.									
LO3	To have an idea of Mahabharata and related works.									
LO4	To closely understand the works of Bana, Dandi, Subandhu, Kalhana etc.									
LO5	To understand the story of Balaramayana									
UNIT	Details									
I	Introduction to Prose literature in Sanskrit Grammar: <i>ikārāntaḥpumlingāḥśabdāḥ</i> - 1. कवि (Kavi) and 2. रवि (Ravi) <i>ikārāntaḥstrīlingāḥśabdāḥ</i> - 1. मति (Mati) <i>ikārāntaḥstrīlingāḥśabdāḥ</i> - 1. नदी (Nadi) <i>ikārāntaḥnapumsakalingāḥśabdāḥ</i> 1. वारि (Vāri)									
II	Short Stories –1. Indradhymna katha 2. Nahusha charithram Introduction to <i>Māhābhārata</i> , the author of बालरामायणम् (<i>Bālarāmāyaṇam</i>) and his works Text: <i>Bālakāṇḍam</i> of <i>Bālarāmāyaṇam</i>									
III	Introduction to the works of <i>Baṇa</i> (<i>Kādambarī</i> and <i>Harṣacaritam</i>), <i>Daṇḍin</i> (<i>Daśakumāracaritam</i> and <i>Avantisundarikāthā</i>) and <i>Subandhu</i> (<i>Vāsavadattā</i>)									
IV	Introduction to Historical <i>Kāvyas</i> in Sanskrit - The works of <i>Kalhaṇaḥ</i> , <i>Bilhaṇaḥ</i> , <i>Bāṇaḥ</i> and <i>Pravarasenaḥ</i>									
V	Grammar: Conjugations - <i>Laṅlakāraḥ</i> (Past tense) (i) अगच्छत् (<i>Agacchat</i>) (ii) अतिष्ठत् (<i>Atiṣṭhat</i>) (iii) अपठत् (<i>Apaṭhat</i>) (iv) अनृत्यत् (<i>Anṛtyat</i>) (v) अकुप्यत् (<i>Akupyat</i>) (vi) अकथयत् (<i>Akathayat</i>) (vii) अगणयत् (<i>Aganayat</i>) (viii) आसीत् (<i>Asīt</i>) (ix) अकरोत् (<i>Akarot</i>) (x) अशृणोत् (<i>Aśṛṇot</i>) Indclinables: (a) तुमुन् (<i>Tumun</i>) suffix ended words (Infinitive forms) (i) गन्तुम् (<i>Gantum</i>) (ii) स्थातुम् (<i>Sthātum</i>) (iii) पठितुम् (<i>Paṭhitum</i>) (iv) नर्तितुम् (<i>Nartitum</i>) (v) कोपितुम् (<i>Kopitum</i>) (vi) कथयितुम् (<i>Kathayitum</i>) (vii)									

	गणयितुं (Gaṇayitum) (viii) भवितुं (Bhavitum) (ix) कर्तुं (Kartum) (x) श्रोतुं (Śrotum) (b) क्त्वा (Ktvā) suffix ended words (Past passive participles)

	(i) गत्वा (Gatvā) (ii) स्मृत्वा (Smṛtvā) (iii) गणयित्वा (Gaṇayitvā) (iv) पठित्वा (Patitvā) (v) कृत्वा Kṛtvā) (c) ल्यप् (Lyap) suffix ended words (Past passive participles) (i) आगत्य (Āgatyā) (ii) (Vismṛtyā) (iii) विगणय्य (Vigaṇayya) (iv) प्रपठ्य (Prapaṭhya) (v) अनकृत्य (Anukṛtyā)

Course Outcomes

Course Outcomes	On completion of this course, students will;	
CO1	Understand and apply grammatical concepts in drafting sentences and paragraphs.	PO1
CO2	Apply the rules and regulations in handling usage of Langlakara and pratyayas, practice exercises and identify errors.	PO1, PO2
CO3	Form an idea of the aesthetic expressions that make Sanskrit composition get the position of pride in world literature.	PO4, PO6
CO4	Demonstrate knowledge of various expressions of opinion, emotions, cause, effect, purpose, and hypothesis in Sanskrit.	PO4, PO5, PO6
CO5	Appreciate the art of employment of Alankaras in a prose form or poetry.	PO3, PO8

TextBooks (Latest Editions)

1.	Kalasala Samskrta Sukha Bodhini II (for under graduate foundation course) Published by University of Madras, Chennai-5

References Books and Web Resources

1.	https://chaukhambapustak.com/index.php?route=product/product&product_id=7647
2.	https://archive.org/details/AShortHistoryOfsanskritLiterature

Question Paper Pattern

Section A – One mark questions. 20 x 1 = 20 Marks
Section B - Answer in brief(Either or type). 5 x 5 = 25 Marks
Section C – Answer any 3 out of 5 Questions. 3 x 10 = 30 Marks

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0
CO 1	3	3	3	3	3	3	3	2	3	2
CO 2	2	3	3	3	2	3	3	2	2	2
CO 3	3	3	3	2	3	3	3	2	3	2
CO 4	3	3	3	3	3	3	3	2	2	2
CO 5	3	2	3	3	3	3	3	2	2	3

3 – Strong, 2 – Medium , 1 - Low**Mapping with Programme Specific Outcomes:**

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

SECOND YEAR - SEMESTER III
Sanskrit Paper III
(Drama, Grammar and History of Sanskrit Literature)

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
23ULS3	Core	Y	Y	-	-	3	5	25	75	100
Learning Objectives										
LO1	To understand dramaturgy in Sanskrit& know the characteristics of Sanskrit drama.									
LO2	To closely understand the work of Karnabharam.									
LO3	To have an idea of the Pre-Kalidasa,Kalidasa & Post-Kalidasa Plays									
LO4	To have a thorough knowledge of Drama Literature upto Allegorical plays.									
LO5	To understand the declensional and conjugational morphology in Sanskrit.									
UNIT	Details									
I	Introduction to Dramaturgy – Ten types of Drama – Characteristics features - <i>Nāndī</i> , <i>Sūtradhāra</i> , <i>Sthāpanā</i> and <i>Bharatavākyam</i> , Prescribed Drama - <i>Karṇabhāram</i> - Page. 01 - 10 (till 10Slokās)									
II	Drama <i>Karṇabhāram</i> - Page. 11 - 32 (Upto the end)									
III	Authorship of 13 Trivandrum play of <i>Bhāsa</i> - Introduction to the Dramas of <i>Kālidāsa</i> , <i>Bhavabhūti</i> , <i>Harṣavardhana</i> and <i>Rājaśekhara</i>									
IV	Introduction to the dramatic works of <i>Viśākhadatta</i> , <i>Śūdraka</i> , <i>Bhaṭṭanārāyaṇa</i> and <i>Murāri</i> - Introduction to Allegorical dramas 1. <i>Prabodhacandrodaya</i> and 2. <i>Saṅkalpasūryodaya</i>									
V	Grammar – <i>Lṛṭlakārāḥ</i> (Future tense) (i) गमिष्यति (<i>Gamiṣyati</i>) (ii) स्थास्यति (<i>Sthāsyati</i>) (iii) पठिष्यति (<i>Paṭhiṣyati</i>) (iv) नर्तिष्यति (<i>Nartiṣyati</i>) (v) कोपिष्यति (<i>Kopiṣyati</i>) (vi) कथयिष्यति (<i>Kathayiṣyati</i>) (vii) गणयिष्यति (<i>Gaṇayiṣyati</i>) (viii) भविष्यति (<i>Bhaviṣyati</i>) (ix) करिष्यति (<i>Kariṣyati</i>) (x) श्रोष्यति (<i>Śroṣyati</i>) Declensions: (<i>Sarvanāmaśabdāḥ</i>) - 1. तद्‌शब्दः (<i>Tad śabdah</i>) in all genders 2. अस्मद्‌शब्दः (<i>Asmadśabdah</i>) 3. युष्मद्‌शब्दः (<i>Yuṣmadśabdah</i>)									
Course Outcomes										
Course Outcomes	On completion of this course, students will;									
CO1	Be familiar with the style of the great Sanskrit Dramatist Bhasa.								PO1	

CO2	Be able to appreciate the aesthetical, social, political, cultural, etc., values expressed in prescribed composition.	PO1, PO2
CO3	Understand the structural patterns of Sanskrit dramatic composition.	PO4, PO6
CO4	Develop the finer and minor nuances of Nataka form of drama.	PO4, PO5, PO6
CO5	Analyze the literary texts.	PO3, PO8
Text Books(Latest Editions)		
1.	Kalasala Samskrta Sukha Bodhini III (for under graduate foundation course)Published by University of Madras, Chennai-5	
References Books and Web Resources		
1.	https://sanskritdocuments.org/doc_z_misc_major_works/karNabhAra.html	
2.	https://archive.org/details/AShortHistoryOfsanskritLiterarure	

Question Paper Pattern	
Section A – One mark questions 20 x 1 = 20 Marks	
Section B – Answer in a paragraph (either or type) 5 x 5 = 25 Marks	
Section C – Answer any 3 out of 5 Questions. 3 x 10 = 30 Marks	

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
CO 1	3	3	3	3	3	3	3	2	3	2
CO 2	2	3	3	3	2	3	3	2	2	2
CO 3	3	3	3	2	3	3	3	2	3	2
CO 4	3	3	3	3	3	3	3	2	2	2
CO 5	3	2	3	3	3	3	3	2	2	3

3 – Strong, 2 – Medium , 1 - Low

Mapping with Programme Specific Outcomes:

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

SECOND YEAR - SEMESTER IV

Sanskrit Paper IV

(Alankara, Didactic and Modern Literatures and Translation)

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
23ULS4	Core	Y	Y	-	-	3	6	25	75	100
Learning Objectives										
LO1	To understand didactic literature in Sanskrit.									
LO2	To know the theme of Pancatantra and Hitopadesa.									
LO3	To develop story writing skills in Sanskrit.									
LO4	To closely understand the figures of speech of speech (alankara) in Sanskrit.									
LO5	To understand the different various types of modern literature in Sanskrit andthe translation.									
UNIT	Details									
I	Introduction to Didactic literature 1. (Pañcatantram andHitopadeśaḥ) Text: The lion and the hare शशकसिंहकथा(Śaśakasimḥakathā) from Pañcatantram and The jackal and the elephant शृगालहस्तिकथा(Śṛgālahastikathā) a story from Mitralābhah of Hitopadeśaḥ									
II	Alaṅkārah - i. Upamā, ii. Rūpakam, iii. Ullekhaḥ, iv. Utprekṣā and v. Vyatirekaḥ vi swabhaavokthi vii vyaajasstuthi viii virodhaabaasa									
III	Didactic literature-2. Neethi - vidhura neethi, sukraneethi – prescribed Slokāś – 10 slokas each.									
IV	Introduction to Modern literature in Sanskrit - Text: तिरुक्कुरल्संस्कृतानुवादः (Sanskrit translation of Tirukkural) Slokāś 1 to 10 ईश्वरवन्दनम् (KaḍavuḷVāzhththu) by कलियन्नामानुजजीयर् (KaliyanRāmānujajīyar) नालडियार् (Nālaḍiyār) translated by श्रीएस्.एन.रामदेशिकः (Śrī S. N. Rāmadeśika) Slokāś: 1 to 5									
V	Translation from prose section Unit - I stories Grammar: Conjugation - Loṭlakārāḥ (Imperative mood) (i) गच्छतु (Gacchatu) (ii) तिष्ठतु (Tiṣṭhatu) (iii) पठतु (Paṭhatu) (iv) शृणोतु (Śṛṇotu) (v) करोतु (Karotu) Declensions – sarvanaama sabdas –1) किम्(kim) 2) यत् (yat)									
Course Outcomes										
Course Outcomes	On completion of this course, students will;									
CO1	Apply the usage of compound words.								PO1	

CO2	Differentiate the alankaras.	PO1, PO2
CO3	Translate the prose passages prescribed.	PO4, PO6
CO4	Identify and apply different grammatical tenses of “Mahabharata” related translation.	PO4, PO5, PO6
CO5	Analyze and critically assess the literary texts.	PO3, PO8
Text Books (Latest Editions)		
1.	Kalasala Samskrta Sukha Bodhini IV (for under graduate foundation course)Published by University of Madras, Chennai-5	
2.	Material prepared by the faculty.	
References Books and Web Resources		
1.	https://archive.org/details/chandraloka	
2.	https://archive.org/details/AShortHistoryOfsanskritLiterature	

Question Paper Pattern	
Section A – one mark questions. 20 x 1 = 20 Marks	
Section B – Answer in a paragraph(either or type) . 5 x 5 = 25 Marks	
Section C – Answer any 3 out of 5 Questions. 3x10=30 Marks	

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
CO 1	3	3	3	3	3	3	3	2	3	2
CO 2	2	3	3	3	2	3	3	2	2	2
CO 3	3	3	3	2	3	3	3	2	3	2
CO 4	3	3	3	3	3	3	3	2	2	2
CO 5	3	2	3	3	3	3	3	2	2	3

3 – Strong, 2 – Medium, 1 - Low

Mapping with Programme Specific Outcomes:

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

Syllabus Semester IV – 2022-2025 Batch

Semester IV	Internal marks 25	External marks 75		
Course code	Course title	Category	Hrs/week	Credits
22ULS4	Drama, History of Drama Literature	Language	5	3

Course Objective

- To describe the History of Drama in Sanskrit literature.
- To recall the story of Mahabharata.
- To gain knowledge about Sanskrit Drama types and characteristics.
- To know the basic concept Alankaras in Sanskrit Literature.

COURSE OUTCOME AND COGNITIVE LEVEL MAPPING

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Tell the story of Madhyamavyayoga drama.	K1,K2,K3
CO2	Decide to believe the greatness of our ancient history of Sanskrit literature.	K3,K2,K6
CO3	Distinguish between different alankaras	K1,K2,K3,K4
CO4	apply the drama characteristics in their own drama.	K1,K2,K3
CO5	Categorize the drama and Alankara varieties.	K1,K2,K3,K4

MAPPING OF CO WITH PO AND PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	2	2	3	3	3	2	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

SYLLABUS - SEMESTER -IV

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction about Bhasa, Drama. मध्यमव्यायोर्: - एकाङ्करूपकम् - summary and character sketches. (pages iii-xxxii) श्री भासरणीतः मध्यमव्यायोर्: (pages 1-16)	15	CO1	K1, K2
II	श्री भासरणीतः मध्यमव्यायोर्: - एकाङ्करूपकम् - (pages 17-25)	20	CO1	K1, K2, K3,
III	श्री भासरणीतः मध्यमव्यायोर्: - एकाङ्करूपकम् - (pages 26-48)	18	CO4	K1, K2, K3,
IV	History of Drama Literature – Origin –development – Authorship of the Trivandrum plays	12	CO1, CO5	K1, K2, K3, K4, K5, K6
V	History of Drama Literature -Dramas of other authors – Types –characteristics of Sanskrit Drama	10	CO1, CO5	K1, K2, K3, K4,
VI	Self Study for Enrichment (Not to be included for External Examination) 1. History of Drama Literature-The Drama Origin-Development of Sanskrit Drama https://en.wikipedia.org/wiki/Drama 2. The Plays of Bhāsa Thirteen Plays of Bhasa: by A. C. Woolner, LakshmanSarup Sanskrit Drama - IV (Bhasa) https://www.youtube.com/watch?v=fcd36JbEdPc JOURNAL ARTICLE - Three Plays of Bhasa in the Trivandrum Sanskrit Series by A. A. MacDonell The Journal of the Royal Asiatic Society of Great Britain and Ireland(Jan., 1913), pp. 186-190 (5 pages) Published By: Cambridge University Press https://www.jstor.org/stable/25188941	-	CO1	K1, K2, K6

TEXT BOOKS

	Text Book(s)
1.	श्री भासप्रणीतः मध्यमव्यायोगः - एकाङ्करीकम् Sri T.K.Ramachandra Aiyar, M.A., B.O.L., Published by R.S. Vadhyar& Sons, Kalpathy, Palghat, 2003.
2.	A Short History of Sanskrit Literature, T.K.RamachandraAiyar, Published by R.S. Vadhyar& Sons, Kalpathy, Palghat, 2002
3.	Chanakya Neeti (Chanakya's Aphorism on Morality), B.K.Chaturvedi Publisher : Diamond Pocket Books (P) LTD., New Delhi. 2004

WEB REFERENCES

	Reference Books
1.	A History of Sanskrit Literature- January 2016 , by Arthur Anthony Macdonell .
2.	A History of Sanskrit Literature-1 January 2015, by Arthur A Macdonell .
3.	Notes on Bhasa's Play Madhyama Vyayoga - Mahabharata nmv">http://mahabharata-resources.org > nmv
4.	The Natyashastra by Bharata-muni https://en.wikipedia.org/wiki/Natya_Shastra

PEDAGOGY : Teaching chalk and Talk method. Action play , ICT and Recitation.

COURSE DESIGNER : Dr.C.R.Sathyakannamani

Dr.S.Ramalakshmi

Dr. N. Savithri

Vice Principal Professor & Head

Dean of Arts, Professor &Head

ANNEXURE C

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC

ISO 9001: 2015 CERTIFIED

TIRUCHIRAPALLI

PG DEPARTMENT OF ENGLISH



B.A ENGLISH

SYLLABUS

2023- 2024 AND ONWARDS

SEMESTER - II

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG DEPARTMENT OF ENGLISH

VISION

- The Department of English envisions the learners to explore and empower LSRW skills there by gaining competency in various genres of literature across the world.
- Ensuring the aesthetic sensibility and creativity of the learners for higher pursuits in research and professional career.

MISSION

- Procure academic excellence by mastering language and literature, imbibe human values embedded with personality enrichment.
- To gratify the needs of employability and enshrine learners as socially responsible citizens

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	STATEMENTS
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

**PROGRAMME OUT COMES FOR BA ARTS (TAMIL, ENGLISH AND
SOCIAL WORK PROGRAMME**

PO NO.	PROGRAMME OUT COMES On completion of BA Programme, the students will be able to
PO1	Possess thorough knowledge of language and understand the concerns of the society in real situations and work environment. (Academic Excellence with Social Thinking)
PO2	Express thoughts and ideas effectively using appropriate texts, media and evaluate practices, policies and theories by applying scientific and social approaches. (Skilled Proficiency)
PO3	Acquire training skills in research, internships and foster team spirit in the global world and face the challenges in a multicultural society. (Team Building and Problem Solving)
PO4	Relate and apply exemplary role models/writers and their values to elucidate different kinds of unknown problems. (Leadership Traits & Critical Thinking)
PO5	Inculcate lifelong learning by fostering scientific attitude aimed at personal and societal development to meet the changing demands of work and career through knowledge and skills. (Situational Approach and Lifelong Learning)

PROGRAMME SPECIFIC OUT COMES FOR BA ENGLISH

PSO NO.	PROGRAMME SPECIFIC OUTCOMES Students of BA English will be able to	POs Addressed
PSO 1	Gain competence and confidence in acquiring LSRW skills in English Language and Literature to face the realities of life.	PO1
PSO 2	Empower and appreciate knowledge of various genres of literature and develop an eclectic taste to appreciate the literary movements, cultural and social contexts in relation with the society and the world.	PO2 PO3
PSO 3	Explore and analyse the works of the writers from political, historical, ethical and sociological perspectives for higher learning and research.	PO3
PSO 4	Attain proficiency to solve the complexities of human life through various genres of literature till the present modern age and train them to be socially committed citizens.	PO1 PO4
PSO 5	Achieve in depth knowledge to comprehend communication skills, linguistics, journalism and literature in different modes of learning to gain job opportunities for a better self and society.	PO5



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.

PG DEPARTMENT OF ENGLISH

BA ENGLISH - Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the Candidates admitted from the Academic Year 2023 - 2024 onwards)

SEMESTER - I

Semester	Part	Course	Title	Subject Code	Inst. Hrs./ Week	Credits	Exam			Total
							Hours	Marks		
								Int	Ext	
I	I	Language Course - I (LC) - Tamil*/Other Languages*	பொதுத்தமிழ் – I	23ULT1	6	3	3	25	75	100
			Hindi ka Samanya Gyan aur Nibandh	23ULH1						
			Poetry, Grammar and History of Sanskrit Literature	23ULS1						
			Foundation Course: Paper – I - French -I	23ULF1						
	II	English Language Course - I (ELC)	General English – I	23UE1	6	3	3	25	75	100
	III	Core Course - I (CC)	Introduction to Literature	23UEN1CC1	6	5	3	25	75	100
		Core Course - II (CC)	Indian Writing in English	23UEN1CC2	6	5	3	25	75	100
		First Allied Course - I (AC)	Social History of England	23UEN1AC1	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - I (AECC)	Value Education	23UGVE	2	2	-	100	-	100
	Total				30	21				600

SEMESTER - II

Semester	Part	Course	Course Title	Subject Code	Inst. Hrs/ Week	Credits	Exam			Total
							Hours	Marks		
								Int.	Ext	
II	I	Language Course - II (LC) - Tamil*/ Other Languages*	பொதுத்தமிழ் - II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar – II	22ULH2						
			Prose, Grammar and History of Sanskrit Literature	23ULS2						
			Basic French – II	22ULF2						
	II	English Language Course - II (ELC)	General English - II	23UE2	6	3	3	25	75	100
	III	Core Course - III (CC)	Poetry – I	23UEN2CC3	6	5	3	25	75	100
		Core Course - IV (CC)	Fiction	23UEN2CC4	5	5	3	25	75	100
		First Allied Course - II(AC)	Literary Forms	23UEN2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - II(AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Extra Credit Course	SWAYAM		As per UGC Recommendation					
Total					30	21				600

SEMESTER – II



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.
PG DEPARTMENT OF ENGLISH
BA ENGLISH - Programme Structure
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the Candidates admitted from the Academic Year 2023 - 2024 onwards)

SEMESTER - II

Semester	Part	Course	Course Title	Subject Code	Inst. Hrs/ Week	Credits	Exam			Total
							Hours	Marks		
								Int.	Ext	
II	I	Language Course - II (LC) - Tamil*/ Other Languages*	பொதுத்தமிழ் - II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar – II	22ULH2						
			Prose, Grammar and History of Sanskrit Literature	23ULS2						
			Basic French – II	22ULF2						
	II	English Language Course - II (ELC)	General English - II	23UE2	6	3	3	25	75	100
	III	Core Course - III (CC)	Poetry – I	23UEN2CC3	6	5	3	25	75	100
		Core Course - IV (CC)	Fiction	23UEN2CC4	5	5	3	25	75	100
		First Allied Course - II(AC)	Literary Forms	23UEN2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - II(AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Extra Credit Course	SWAYAM		As per UGC Recommendation					
Total					30	21				600

SIGNATURE		
NAME & DESIGNATION	Dr. S. Jayashree Agarwal UG - HOD	Dr. N. Savithri Dean

Semester - I I	Internal Marks: 25		External Marks: 75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23UE2	GENERAL ENGLISH- II	ENGLISH LANGUAGE COURSE - II	6	3

COURSE OBJECTIVES

- To acquire language competency by enhancing LSRW skills
- To acquire vocabularies to frame apposite sentences and to express thoughts affluently
- To understand the different forms of sentences and its transformation thereby creating appropriate contents

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Recall the appropriate usage of phrases and clauses and relate them with different sentence structures.	K1
CO2	Explain and interpret using appropriate vocabulary and Grammar in communication and writing.	K2
CO3	Build knowledge to frame spoken and written expressions for holistic learning and for higher learning.	K3
CO4	Identify and explore the vocabulary and sentence structures in different genres.	K3
CO5	Analyze and synthesize the four skills of language learning to construct creative contents for better prospects.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Listening - AOE LAB - Level -III- Units – 1, 2 & 3 Speaking - Share your Unforgettable Experience Reading - Short Story - Oscar Wilde - <i>The Devoted Friend</i> Writing – Notices, Writing a Report Grammar - Parts of Speech (Practice Exercises)	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Listening - AOE LAB - Level -III - Units- 4, 5 & 6 Speaking – Importance of Technology on Society Reading - Prose: Francis Bacon- “Of Gardens” Writing – CV Writing, Cover Letter, Letter of Recommendation Grammar - Phrases and Clauses	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Listening - AOE LAB - Level III - Unit- 7- Level IV - Units- 1 & 2 Speaking - Speaking about your Dream Career Reading - One - Act Play: Fritz Karinthy - <i>Refund</i> Writing – E-mails & Tweets Grammar - Sentences, Kinds and Types of Sentences	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Listening - AOE LAB - Level IV- Units- 3 & 4 Speaking – Is Freedom of Speech a Necessity Reading - Fiction: Kenneth Grahame - <i>The Wind in the Willows</i> Writing – Blogs and Vlog Writing Grammar - Question Tags	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	Listening - AOE LAB- Level IV - Units- 5, 6 & 7 Speaking – Contemporary Social and Political Issues. Reading - Poetry: William Wordsworth – “My Heart Leaps Up” Writing – Poster Making and Advertising Grammar - Direct and Indirect Speech	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-study for Enrichment (Not to be Included for End Semester Examination) Short Story: Amy Tan - <i>Two Kinds</i> https://youtu.be/Uo9b6LsgEuU?si=t01bjPcP-Bj6SQ1g https://youtu.be/z97_vajw-Do?si=Dfu5lUNoMhU5liTy	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

* AOE LAB and Speaking will not be Included for Question Paper Settings

* Its for Internal Assessment Only

TEXT BOOKS

Chakraverty, Anima. *Comprehensive Grammar and Composition by Pearson*. 2011.

David, James and Christian, Thomas. *English Today*. IELSC Publications, 2000.

REFERENCE BOOKS

Murphy, Raymond. *English Grammar in Use: A Self Study and Practice Book Intermediate Learners Book*. Cambridge University Press, 2013.

Bhatnagar R.P. and Bhargava Rajul. *English for Competitive Examinations*. Macmillan. 2002.

WEB REFERENCES

<https://www.grammarbook.com/grammar/clause-phrase.asp>

<https://www.inenglishwithlove.com/blog/improving-sentence-structure>

<https://learnenglish.britishcouncil.org/skills/reading>

https://dictionary.cambridge.org/grammar/british-grammar/reported-speech_2

<https://cpb-us-w2.wpmucdn.com/campuspress.yale.edu/dist/4/2533/files/2018/08/two-kinds-amy-tan-1nl7j7y.pdf>

PEDAGOGY - Vocabulary Enrichment Sheet, Group Discussion, Quiz, Assignment, Adding contents to Student's English Portfolio.

COURSE DESIGNER - Ms. Diana Betty Garrett

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester - II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
23UEN2CC3	POETRY - I	CORE COURSE – III	6	5

COURSE OBJECTIVES

- To enable the learners to master Poetry by giving rich background knowledge of the poets, poems and its poetic elements.
- To expose the learners to write creative poetry, think critically and identify the musical elements of the poem and the poetic devices.
- To enhance and empower learners' knowledge with social, cultural, moral and humanitarian values.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Recall and relate the various elements of poetry, rhyme, meter, tone, and themes by understanding the content and real-life situations in society.	K1
CO2	Illustrate and interpret the contents of the poem with a social and cultural background.	K2
CO3	Explain the values in the poem with a moralistic outlook and enrich learners with a thought-provoking touch for higher learning and research.	K2
CO4	Identify the various poetic devices and structural aspects of the poem.	K3
CO5	Analyse and explore the poems and poets from a multi-dimensional paradigm with holistic thinking to create a better self and a better world.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	3	3	3
CO2	3	3	3	3	3	3	2	2	2	3
CO3	2	3	3	3	3	2	2	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	2	3

“1”– Slight (Low) Correlation

“2”- Moderate (Medium) Correlation

“3”–Substantial (High) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENTS	HOURS	COs	COGNITIVE LEVEL
I	The Age of Shakespeare Shakespeare – “All the World’s a Stage” George Herbert – “The Pulley”	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	The Age of Milton John Milton – “Lycidas” Abraham Cowley – “The Wish”	18	CO1, CO2, CO3, CO4, CO5	K1,K2, K3, K4
III	The Age of Dryden and Pope John Dryden – “A Song for St. Cecilia’s Day” Alexander Pope – “Ode on Solitude”	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	The Romantic Age S.T. Coleridge – “The Rime of the Ancient Mariner” P.B Shelley – “Ode to the West Wind”	18	CO1,CO2, CO3, CO4, CO5	K1,K2, K3, K4
V	The Victorian Age Alfred Tennyson – “Tithonus” Dante Gabriel Rossetti – “The Blessed Damozel”	18	CO1,CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Background study of various poets and poems - Romantic Poets - Significance of Nature in poetry– Identification of themes and values – Sonnets of Shakespeare	-	CO1,CO2, CO3,CO4, CO5	K1, K2, K3, K4

TEXT BOOKS

Zama, Margaret *Poetry Down the Ages*, Orient Blackswan, 2006.

REFERENCE BOOKS

Green, David. *The Winged Word*, Macmillan 2006.

Sengupta, Ambika. *Selected College Poems*, Orient Blackswan, 2009

WEB REFERENCES

<https://internetpoem.com/william-shakespeare/all-the-world-s-a-stage-poem/>

<https://www.poemhunter.com/poem/the-pulley/>.

<https://rpo.library.utoronoto.ca/content/lycidas>

https://englishverse.com/poems/the_wish

<https://poets.org/poem/song-st-cecilas-day>

<https://allpoetry.com/Tithonous>

PEDAGOGY - Quiz, Seminar, Discussion

COURSE DESIGNER - Dr. Cecilia Merlin Wilton

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester – II	Internal Marks: 25		External Marks: 75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23UEN2CC4	FICTION	CORE COURSE - IV	5	5

COURSE OBJECTIVES

- To identify the strategies in the novel relating to plot, theme, characters etc.
- To build vocabulary knowledge and create a passion for reading books by enhancing reading skills.
- To analyse the text from social, cultural and moral background and thereby inculcate values.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Recall and relate the story by exploring the novel to know the society and the world.	K1
CO2	Illustrate the characters, themes and plot and examine in real life situations.	K2
CO3	Explain the novel creating an interest to delve deep in narrative techniques of the novel for higher learning.	K2
CO4	Construct the different strategies of the novel by exploring the myth, culture, values and in reality.	K3
CO5	Analyse the novel from various perspectives to develop a holistic thinking for better prospects.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	3	3	3	2	3	3	2	2	3
CO4	3	3	2	3	3	3	3	2	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Harper Lee – <i>To Kill A Mocking Bird</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Charles Dickens - <i>A Christmas Carol</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Mulk Raj Anand – <i>Untouchable</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Toni Morrison - <i>God Help the Child</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	Anita Desai - <i>Clear Light of Day</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Robert Louis Stevenson: <i>Treasure Island</i>	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Lee, Harper. *To Kill A Mocking Bird*, Harpercollins, 2015
 Dickens, Charles. *A Christmas Carol*, Penguin Classics, 2003.
 Anand, Mulk Raj. *Untouchable*, Penguin Classics, 2014.
 Morrison, Toni. *God help the Child*, Vintage Publishing, 2016.
 Desai, Anita. *Clear Light of Day*, Penguin Random House India, 2012.

BOOKS FOR REFERENCE

Roberts, Edgar V. *An Introduction to Reading and Writing*. Fourth Edition, New Jersey: Prentice Hall. 1993.
 Sucksmith, Harvey Peter, *The Narrative Art of Charles Dickens*. Great Britain: University Press, Oxford. 1970.
 Kumar, Gajendra and Uday Shankar Ojhe. *Indian English Fiction: Readings and Reflections*, Karan Paperbacks, New Delhi: 2019.
 Desai, Anita. *Clear Light of Day*. Lall R Paperback, New Delhi: 1 January 2003.

WEB REFERENCES

<https://www.charlesdickenspage.com/carol-dickens-reading-text.html>
https://www.academia.edu/22427817/A_critical_analysis_on_To_Kill_A_Mockingbird
<https://www.javatpoint.com/untouchable-summary>
<https://www.onlinereadfreebooks.com/en/God-Help-the-Child-A-novel-546882/1>
<https://www.worldwidejournals.com/global-journal-for-research`-analysis>

PEDAGOGY – Group Discussion, Seminar, Quiz and Assignment

COURSE DESIGNER - Ms. T. Haseena Banu

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

SEMESTER - II	Internal Marks: 25		External Marks: 75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23UEN2AC2	LITERARY FORMS	FIRST ALLIED COURSE - II	5	3

COURSE OBJECTIVES

- To introduce learners to various genres of literature thoroughly.
- To familiarize works of literature classified by various strategies and forms.
- To provide students a holistic approach to analyze literature in different perspectives

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of the course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Relate and define the skills to analyze the text in terms of their content, purpose and form in language and literature.	K1
CO2	Interpret the texts in terms of social, cultural, theoretical and historical contexts and for research in a multicultural society.	K2
CO3	Classify the texts for a variety of purposes and assess the effectiveness in conveying the meaning for higher learning and research.	K2
CO4	Identify the elements of Drama and Poetry from a multi-dimensional level for a holistic thinking.	K3
CO5	Analyse the Literary Forms in terms of style, figurative language and Convention in various genres for higher learning and better prospects.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	2	2	3	2	2	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	2	3	2	2	2	3	3	2
CO5	3	3	3	2	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Definition - Nature and Elements of Poetry - Subjective and Objective Poetry -The Lyric. The Ode - The Sonnet - The Elegy - The Idyll - The Epic -The Ballad - The Satire - Heroic couplet - Terza rima - The Rhyme Royal - Ottava rima -The Spenserian stanza.	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Allegory - Allusion - Alliteration - Metaphor - Simile - Onomatopoeia - Dramatic Irony - Aside - Soliloquy - Farce - Catastrophe - Catharsis - Pathetic Fallacy - Personification.	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Origin of the English Drama - Origin of the English Theatre - Dramatic Types - Tragedy and Comedy - Tragic - Comedy - Farce and Melodrama - The Masque - One - Act Play - The Dramatic Monologue - Flat and Round Characters	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Elements of Fiction - Short Story - Historical Novel - Picaresque Novel - Detective Fiction - Science Fiction -The Sentimental Novel - Gothic novel.	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	The Essay - Biography - Autobiography - Literary Criticism – Style	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self -study for Enrichment (Not To Be Included for End Semester Examination) Shakespearean Comedy - Shakespearean Tragedy - Shakespearean Romance - Shakespeare’s English Historical Plays - Shakespeare’s Roman plays.	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Prasad.B, *A Background to the Study of English Literature*, Trinity Press Publication, New Delhi, 1999.

REFERENCE BOOKS

W.H.Hudson, *Introduction to the Study of English*. AITBS Publishers, 2009.

Kumar Sathish, *Ages, Movements and Literary Forms*. Agra. Educational Publisher, 2007

Abrams,M.H. *A Glossary of Literary Terms*. Fort Worth: Harcourt Brace Jovanovich College Publishers, 1993.

WEB REFERENCES

<https://examples.yourdictionary.com/different-types-of-drama-in-literature.html>

<https://www.homeofbob.com/literature/genre/poetry/elements.html>

<https://penandthepad.com/dramatic-techniques-literature-8618589.html>

PEDAGOGY - Group Discussion, Assignments, Quiz

COURSE DESIGNER - Ms. K. Kanimozhi

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC
ISO 9001: 2015 CERTIFIED
TIRUCHIRAPPALLI

PG DEPARTMENT OF ENGLISH



B.A ENGLISH

SYLLABUS

2022- 2023 AND ONWARDS

SEMESTER – IV & V

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG DEPARTMENT OF ENGLISH

VISION

- The Department of English envisions the learners to explore and empower LSRW skills there by gaining competency in various genres of literature across the world.
- Ensuring the aesthetic sensibility and creativity of the learners for higher pursuits in research and professional career.

MISSION

- Procure academic excellence by mastering language and literature, imbibe human values embedded with personality enrichment.
- To gratify the needs of employability and enshrine learners as socially responsible citizens

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	STATEMENTS
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

**PROGRAMME OUT COMES FOR BA ARTS (TAMIL, ENGLISH AND SOCIAL
WORK PROGRAMME**

PO NO.	PROGRAMME OUT COMES On completion of BA Programme, the students will be able to
PO1	Possess thorough knowledge of language and understand the concerns of the society in real situations and work environment. (Academic Excellence with Social Thinking)
PO2	Express thoughts and ideas effectively using appropriate texts, media and evaluate practices, policies and theories by applying scientific and social approaches. (Skilled Proficiency)
PO3	Acquire training skills in research, internships and foster team spirit in the global world and face the challenges in a multicultural society. (Team Building and Problem Solving)
PO4	Relate and apply exemplary role models/writers and their values to elucidate different kinds of unknown problems. (Leadership Traits & Critical Thinking)
PO5	Inculcate lifelong learning by fostering scientific attitude aimed at personal and societal development to meet the changing demands of work and career through knowledge and skills. (Situational Approach and Lifelong Learning)

PROGRAMME SPECIFIC OUT COMES FOR BA ENGLISH

PSO NO.	PROGRAMME SPECIFIC OUTCOMES Students of BA English will be able to	POs Addressed
PSO 1	Gain competence and confidence in acquiring LSRW skills in English Language and Literature to face the realities of life.	PO1
PSO 2	Empower and appreciate knowledge of various genres of literature and develop an eclectic taste to appreciate the literary movements, cultural and social contexts in relation with the society and the world.	PO2 PO3
PSO 3	Explore and analyse the works of the writers from political, historical, ethical and sociological perspectives for higher learning and research.	PO3
PSO 4	Attain proficiency to solve the complexities of human life through various genres of literature till the present modern age and train them to be socially committed citizens.	PO1 PO4
PSO 5	Achieve in depth knowledge to comprehend communication skills, linguistics, journalism and literature in different modes of learning to gain job opportunities for a better self and society.	PO5



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.

PG DEPARTMENT OF ENGLISH

BA ENGLISH - Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the Candidates admitted from the Academic Year 2022 - 2023 onwards)

SEMESTER - I

Semester	Part	Course	Course Title	Course Code	Inst. Hrs./ Week	Credits	Exam			Total
							Hours	Marks		
								Int.	Ext	
I	I	Language Course - I(LC) - Tamil*/ OtherLanguages*	Ikkala Ilakiyam - I	22ULT1	6	3	3	25	75	100
			Hindi Literature & Grammar - I	22ULH1						
			History of Popular Tales, Literature and Sanskrit Story	22ULS1						
			Basic French - I	22ULF1						
	II	English Language Course - I (ELC)	Functional English for Effective Communication - I	22UE1	6	3	3	25	75	100
	III	Core Course - I (CC)	Prose	22UEN1CC1	6	6	3	25	75	100
		Core Course - II (CC)	Short Stories	22UEN1CC2	6	6	3	25	75	100
		First Allied Course - I (AC)	Social History of England	22UEN1AC1	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - I (AECC)	UGC - Jeevan Kaushal Universal Human Values	22UGVE	2	2	-	100	-	100
	Total				30	23				600

SEMESTER - II

Semester	Part	Course	Course Title	Course Code	Inst. Hrs/ Week	Credits	Exam			Total
							Hours	Marks		
								Int.	Ext	
II	I	Language Course - II (LC) - Tamil*/ Other Languages*	Idaikala Ilakiyamum Pudhinamum	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar - II	22ULH2						
			Poetry, Textual Grammar and Alakara	22ULS2						
			Basic French - II	22ULF2						
	II	English Language Course - II (ELC)	Functional English for Effective Communication -II	22UE2	6	3	3	25	75	100
	III	Core Course - III (CC)	Poetry - I	22UEN2CC3	6	6	3	25	75	100
		Core Course - IV (CC)	Fiction	22UEN2CC4	6	6	3	25	75	100
		First Allied Course - II (AC)	Literary Forms	22UEN2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Extra Credit Course	SWAYAM		As per UGC Recommendation					
Total					30	23				600



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.

**PG DEPARTMENT OF ENGLISH
BA ENGLISH - Programme Structure**

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the Candidates admitted from the Academic Year 2022 - 2023 onwards)

SEMESTER - III

Semester	Part	Course	Course Title	Course Code	Inst. Hrs / Week	Credits	Exam			Total
							Hours	Marks		
								Int.	Ext	
III	I	Language Course - III (LC) - Tamil*/ Other Languages*	Kapiyamum Nadagamum	22ULT3	5	3	3	25	75	100
			Hindi Literature & Grammar –III	22ULH3						
			Prose, Textual Grammar and Vakyarachana	22ULS3						
			Intermediate French - I	22ULF3						
	II	English Language Course - III (ELC)	Learning Grammar Through Literature - I	22UE3	6	3	3	25	75	100
	III	Core Course - V (CC)	One Act Plays	22UEN3CC5	6	6	3	25	75	100
		Core Course - VI (CC)	Poetry - II	22UEN3CC6	5	5	3	25	75	100
		Second Allied Course - I (AC)	History of English Literature - I	22UEN3AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
		Generic Elective Course - I (GEC)	Presentation Skills in English	22UEN3GEC1	2	2	3	25	75	100
			Basic Tamil - I	22ULC3BT1						
			Special Tamil - I	22ULC3ST1						
	Extra Credit Course	SWAYAM		As per UGC Recommendation						
Total					30	23				700
	15 DAYS INTERNSHIP DURING SEMESTER HOLIDAYS									

SEMESTER - IV

Semester	Part	Course	Course Title	Course Code	Inst. Hrs /Week	Credits	Exam			Total
							Hours	Marks		
								Int	Ext	
IV	I	Language Course - IV (LC) - Tamil*/ Other Languages*	Pandaiya Illakiyamum Urainadaiyum	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French – II	22ULF4						
	II	English Language Course - IV (ELC)	Learning Grammar Through Literature – II	22UE4	6	3	3	25	75	100
	III	Core Course - VII (CC)	Drama	22UEN4CC7	5	5	3	25	75	100
		Core Course - VIII (CC)	Introduction of Language and Linguistics	22UEN4CC8	5	5	3	25	75	100
		Second Allied Course – II(AC)	History of English Literature –II	22UEN4AC4	4	3	3	25	75	100
		Internship	Internship	22UEN4INT	-	2	-	-	-	100
	IV	Generic Elective Course -II (GEC)	Communication Skills in English	22UEN4GEC2	2	2	3	25	75	100
			Basic Tamil – II	22ULC4BT2						
			Special Tamil -II	22ULC4ST2						
	V	Skill Enhancement Course - I (SEC)	Public Speaking (P)	22UEN4SEC1P	2	2	3	40	60	100
	Extra Credit Course	SWAYAM		As per UGC Recommendation						
Total					30	25				800



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.
PG DEPARTMENT OF ENGLISH
BA ENGLISH - Programme Structure
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the Candidates admitted from the Academic Year 2022 - 2023 onwards)

SEMESTER - V

Semester	Part	Course	Course Title	Course Code	Inst. Hrs / Week	Credits	Exam			Total
							Hours	Marks		
								Int	Ext	
V	III	Core Course - IX (CC)	Shakespeare	22UEN5CC9	6	6	3	25	75	100
		Core Course - X (CC)	Principles of Literary Criticism	22UEN5CC10	5	5	3	25	75	100
		Core Course - XI (CC)	American Literature	22UEN5CC11	5	5	3	25	75	100
		Core Course - XII (CC)	Women’s Writing in English	22UEN5CC12	5	5	3	25	75	100
		Discipline Specific Elective - I (DSE)	A. Diasporic Literature	22UEN5DSE1A	5	4	3	25	75	100
			B. Translation: Theory and Practice	22UEN5DSE1B						
	C. World Classics in Translation		22UEN5DSE1C							
	IV	Ability Enhancement Compulsory Course - IV (AECC)	UGC – Jeevan Kaushal – Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course - II (SEC)	English for BPO	22UEN5SEC2	2	2	3	25	75	100
		Extra Credit Course		SWAYAM	As per UGC Recommendations					
Total				30	29				700	

SEMESTER - VI

Semester	Part	Course	Course Title	Course Code	Inst. Hrs / Week	Credits	Exam			Total
							Hours	Marks		
								Int	Ext	
VI	III	Core Course - XIII (CC)	English Language Teaching	22UEN6CC13	4	4	3	25	75	100
		Core Course - XIV (CC)	Indian Writing in English	22UEN6CC14	5	5	3	25	75	100
		Core Course - XV (CC)	Commonwealth Literature	22UEN6CC15	5	5	3	25	75	100
		Core Course - XVI (CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Discipline Specific Elective - II (DSE)	A. Journalism	22UEN6DSE2A	5	4	3	25	75	100
			B. Content Writing	22UEN6DSE2B						
			C. Phonetics	22UEN6DSE2C						
	Project	Project Work	22UEN6PW	5	3	-	-	100	100	
	V	Ability Enhancement Compulsory Course-V (AECC)	Gender Studies	22UGGS	1	1	-	100	-	100
		Extension Activity		22UGEA	-	1	-	-	-	-
		Total			30	27				700
		GRAND TOTAL			180	150				4100

COURSES & CREDITS FOR UG PROGRAMME

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/Other Languages	4	12	12
II	English	4	12	12
III	Core Courses	16	84	109
	Project Work	1	3	
	Internship	1	2	
	First Allied–Allied Course (AC)	2	6	
	Second Allied–Allied Course (AC)	2	6	
	Discipline Specific Elective (DSE)	2	8	
IV	Generic Elective Course (GEC)	2	4	15
	Skill Enhancement Course (SEC)	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II- Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV-Professional Skills	1	2	
V	AECC-V-Gender Studies	1	1	02
	Extension Activities	-	1	
	Total	41		150

Signature		
Name & Designation	Dr. S. Jayashree Agarwal HOD	Dr. N. Savithri Dean

SEMESTER – IV



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.
PG DEPARTMENT OF ENGLISH
BA ENGLISH - Programme Structure
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the Candidates admitted from the Academic Year 2022 - 2023 onwards)

SEMESTER – IV

Semester	Part	Course	Course Title	Course Code	Inst. Hrs / Week	Credits	Exam			Total
							Hours	Marks		
								Int	Ext	
IV	I	Language Course - IV(LC) - Tamil*/ Other Languages*	Pandaiya Illakiyamum Urainadaiyum	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French – II	22ULF4						
	II	English Language Course - IV (ELC)	Learning Grammar Through Literature – II	22UE4	6	3	3	25	75	100
	III	Core Course - VII (CC)	Drama	22UEN4CC7	5	5	3	25	75	100
		Core Course - VIII (CC)	Introduction of Language and Linguistics	22UEN4CC8	5	5	3	25	75	100
		Second Allied Course – II (AC)	History of English Literature – II	22UEN4AC4	4	3	3	25	75	100
		Internship	Internship	22UEN4INT	-	2	-	-	-	100
	IV	Generic Elective Course -II (GEC)	Communication Skills in English	22UEN4GEC2	2	2	3	25	75	100
			Basic Tamil – II	22ULC4BT2						
			Special Tamil -II	22ULC4ST2						
	V	Skill Enhancement Course - I (SEC)	Public Speaking (P)	22UEN4SEC1P	2	2	3	40	60	100
	Extra Credit Course	SWAYAM		As per UGC Recommendation						
	Total				30	25			800	

SIGNATURE		
NAME & DESIGNATION	Dr. S. Jayashree Agarwal UG - HOD	Dr. N. Savithri Dean

Semester - IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UE4	LEARNING GRAMMAR THROUGH LITERATURE - II	ENGLISH LANGUAGE COURSE - IV	6	3

COURSE OBJECTIVES

- A strong grasp of language through literature to enhance communication skills both in Writing and Speaking.
- Learning Language through literature can be more engaging and enjoyable.
- Literature allows learners to critically analyze sentence structure, presentation choices and grammatical nuance used by authors to convey meaning.
- Studying Language through literature can improve creativity in writing and encourage learner to experiment with language in their own writing.

COURSE OUTCOME AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Remember, recall and develop the interest in poems, short stories and prose to strengthen life values, and appreciative skills with a social and moralistic approach.	K1
CO2	Illustrate and explain roleplays and actions based on situational learning for conversational practice.	K2
CO3	Identify poetry through poetical devices and explore the poems in a holistic manner.	K3
CO4	Examine the communicative skills effectively and appropriately in real life situations and enhance grammar knowledge and vocabulary building.	K4
CO5	Compare and contrast literary ideas from texts and arrive at conclusions to improve language through literature for learners to gain better prospects.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	3	3	2	3
CO2	3	2	3	3	2	3	2	3	3	3
CO3	3	3	3	3	2	3	2	3	3	3
CO4	3	2	3	3	3	3	3	3	3	3
CO5	2	3	2	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	POETRY - Robert Frost – “Mending Wall” John Keats – “Ode to a Nightingale” SPOKEN ENGLISH – Meeting People, Exchanging Greetings and Taking Leave	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	PROSE - Stephen Leacock – “My Financial Career” A.G.Gardiner - “On the Rule of the Road” SPOKEN ENGLISH -Answering the Telephone and Asking for Someone, Dealing with a Wrong Number	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	SHORT STORY - Rabindranath Tagore - <i>The Postmaster</i> Anton Chekov – <i>The Bet</i> SPOKEN ENGLISH –Getting People’s Attention and Interrupting, Giving Instructions and Seeking Clarification	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	GRAMMAR - Question Tags Transformation of Sentences (Continued) Simple, Compound and Complex Active and Passive Voice Reported Speech I & II SPOKEN ENGLISH – Describing Daily Routines, Talking about Possessions, Asking for the Time and Date	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Interview Skills - Letter of Application & CV Preparing for Interviews Group Discussion SPOKEN ENGLISH – Accepting and Refusing a Job Offer, Apologizing and Responding to an Apology	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment (Not to be Included for End Semester Examination) POEM – William Wordsworth- “Daffodils” Rudyard Kipling – “If” SHORT STORY - O Henry - <i>After 20 Years</i> John Donne - <i>No Man Is an Island</i> PROSE – Carlyle – “Signs of the Time” Macaulay – “London in 1685”	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

❖ Spoken English Not Included for End Semester Examination

TEXT BOOKS

Keats, John. Selincourt, Ernest De (ed). *The Poems of John Keats*. Dodd Mead & Company, 1905

Tagore, Rabindranath. *The Postmaster*, Createspace Independent Publishing Platform, 2014.

Sadanand, Kamlesh & Punitha, Susheela. *Spoken English A Foundation Course, Part – I & II*, Orient Blackswan Publishers, 2008

Chekhov Anton, 'The Bet 'Masterpiece (Pymble, N.S.W) Angus & Robertson 1995

BOOKS FOR REFERENCE

Haglund, David (2013-08-15). "What Orange Is the New Black Gets Right About Robert Frost". Slate. ISSN 1091-2339. Retrieved 2023-04-20.

Brooks, Cleanth & Warren, Robert Penn (1968), "The Ode to a Nightingale", in Stillinger, Jack (ed.), Keats's Odes, Englewood, NJ: Prentice-Hall, pp. 44–47.

McDonald, Russ (2001). The Bedford Companion to Shakespeare: An Introduction with Documents. Bedford/St. Martin's. pp. 53–. ISBN 978-0312248802. Retrieved 2014-11-25.

Brooks, Cleanth & Warren, Robert Penn (1968), "The Ode to a Nightingale", in Stillinger, Jack (ed.), Keats's Odes, Englewood, NJ: Prentice-Hall, pp. 44–47.

WEB REFERENCES

<https://www.comparetoday.in/books/English-for-Competitive-Examinations-3rd-Edition/9780230638075>

<https://poemanalysis.com/langston-hughes/harlem-a-dream-deferred/>

<https://www.supersummary.com/the-bet/summary/>

PEDAGOGY - Assignment, Quiz and Seminar

COURSE DESIGNER – Ms.C.Chithra

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester – IV	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UEN4CC7	DRAMA	CORE COURSE -VII	5	5

COURSE OBJECTIVES

- To incorporate reading and writing in a conversational form
- To understand the description and writing of different authors from various homeland.
- To initiate interest in other interrelated social science

COURSE OUTCOME AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Recall the elements of Drama and explain how these elements combine a theatrical experience.	K1
CO2	Explain the limitations and opportunities pertaining to the theatre and film.	K2
CO3	Construct a drama by using the similar characters were virtue is rewarded and vices punished to enhance creative skills for higher learning.	K3
CO4	Identifying the types of drama and their characteristics.	K2
CO5	Analyze the significance of drama from the audience perspective.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	2	3	3	2	3	2
CO2	2	3	2	3	2	2	2	2	3	2
CO3	2	2	2	3	2	2	2	2	3	2
CO4	2	3	2	2	2	2	2	2	3	2
CO5	3	2	2	2	3	2	2	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Thomas Kyd - <i>The Spanish Tragedy</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Christopher Marlowe - <i>Dr.Faustus</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Samuel Beckett - <i>Waiting for Godot</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	G. B Shaw – <i>Pygmalion</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	T. S. Eliot - <i>Murder in the Cathedral</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-Study For Enrichment (Not To Be Included for End Semester Examination) Ben Johnson - <i>The Alchemist</i>	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Beckett, Samuel. *Waiting for Godot*. New Delhi: Rama Brothers India, Pvt.Ltd.2015.
 Eliot, T.S. *Murder in the Cathedral*. New Delhi: Surjeet Publications. 1963.
 Kyd, Thomas. *The Spanish Tragedy*. Kessinger Publishers. 2004.
 Marlowe, Christopher. *Dr.Faustus*. Dover publications.1994.

REFERENCE BOOKS

Hutchings ,William. *Samuel Beckett's Waiting for Godot: A Reference Guide*. Cliff notes,1980
 Shaw, George Bernard. *Pygmalion*. New Delhi: Maple Press. New Delhi: Maple Press,2014
 T.S. Eliot. *Murder in the Cathedral*. Unique publications, 2020

WEB REFERENCES

https://en.wikipedia.org/wiki/the_spanish_tragedy
<https://www.cliffsnotes.com/literature/d/doctor-faustus/play-summary>
<https://interestingliterature.com/2021/06/t-s-eliot-murder-in-the-cathedral-summary-analysis/>

PEDAGOGY - Group Discussion, Assignments, Quiz

COURSE DESIGNER - Ms. K. Kanimozhi

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester - IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UEN4CC8	INTRODUCTION OF LANGUAGE AND LINGUISTICS	CORE COURSE - VIII	5	5

COURSE OBJECTIVES

- To introduce the learners of English language to Linguistics.
- To classify sounds and other units of a word.
- To enables the learners to gain knowledge in further application of the learnt concepts.
- To develop proper articulation and classification of sounds.

COURSE OUTCOME AND COGNITIVE LEVEL MAPPING

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Recall and identify the study of linguistics and its purpose.	K1
CO2	Explain the mechanism and the biological organs involved in speech production.	K2
CO3	Apply and classify speech sounds as vowels, consonant and its further distribution for higher learning.	K3
CO4	Examine to determine speech sounds into basic elements.	K4
CO5	Analyze the semantics and syntax of a sentence and transcribe the spoken language text.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	3	2	3	3
CO2	2	3	3	3	3	2	3	2	3	3
CO3	3	3	3	3	3	2	3	2	3	2
CO4	3	3	3	2	3	2	3	3	3	3
CO5	3	3	3	3	3	2	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	The Origin and the Development of Language	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	The Organs of Speech – Classification of Speech Sounds	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Phonology – Morphology	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Syntax – Semantics	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	Social Variation in Language	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-Study For Enrichment (Not To Be Included for End Semester Examination) Gestures and Sign Language	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Yule, George. *The Study of Language: An Introduction*. Cambridge: Cambridge UP, 1985
Balasubramanian. *T A Textbook of English Phonetics for Indian Students*. Laxmi publisher, 2017.
O'Connor.J.D *Better English Pronunciation*. Cambridge University Press, 1980. 2nd Edition.

REFERENCE BOOKS

Wrenn.C L. *The English Language*. London: Methuen, 1949.

WEB REFERENCES

<https://learnclax.com/schooltextbooks/schooltextbooks.php?bookid=4481&The-Study-of-Language-7th-edition-PDF-by-George-Yule>
https://books.google.co.in/books/about/The_English_Language.html?id=RdxDAQAAIAAJ&redir_esc=y

PEDAGOGY - Phonetic Transcription, Quiz, Assignment

COURSE DESIGNER - Ms. A. Violet Pangaja Bai

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester - IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UEN4AC4	HISTORY OF ENGLISH LITERATURE – II	SECOND ALLIED COURSE - II	4	3

COURSE OBJECTIVES

- To have extensive knowledge of the historical and political impact on English Literature.
- To enrich the knowledge of biographical details of the English Literary authors.
- To expose the students, to understand the varied genres in English Literature.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Relate and understand the historical, sociocultural contexts, literary movements and styles that emerged in different ages of England.	K1
CO2	Infer about prominent writers and famous works in English literature.	K2
CO3	Develop knowledge about the genres of literature and their emergence and growth through the ages for higher learning.	K3
CO4	Analyze the religious and political history of England influenced the English writers from the Transition Age to Modern Age for higher learning and research.	K4
CO5	Examine and explore the learners' skills through the preparation of various concepts in literature through critical thinking in literary studies for better prospect.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	2	3	3	3	3	3	3	3	3
CO3	3	3	3	2	3	3	2	3	3	3
CO4	3	3	3	3	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	The Age of Transition or Pre-Romantic Period General Features – chief characteristics of Pre-Romantic Poetry Growth of Poets, Prose Writers, Novelists The Reactionary School: Samuel Johnson The Transitional Poets	12	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	The Romantic Age /The Return to Nature / The Age of Wordsworth Introduction – Historic Background, Theme, Style Precursors of Romanticism The Older Poets & The Younger Poets Growth of Romantic Literature: Poets -Prose Writers – Literary Criticism – Novelist	12	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	The Victorian Age or The Age of Tennyson Introduction – Historic Background, Theme, Style Growth of Victorian Literature: Poets, Prose Writers, Play Writers and Novelists	12	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	The Edwardian Period - The Georgian Period The Historic Background, Theme, Style Georgian Poets and their characteristics	12	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	The Twentieth Century- onwards Introduction – Historic Background, Theme, Style Social and Political Developments in the 20 th Century Growth of Literature: Poetry, Prose, Drama, Fiction	12	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-study for Enrichment (Not to be included for End Semester Examination) Satanic School – Cockney School, Dark Romantic – Transcendentalism -The Pre-Raphaelite Movement - War Poets - Oxford Movements - Existentialism - Black Comedy- Angry Young Man - Kitchen Sink Drama – Dadaism - Absurd Drama	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Albert, Edward. *History of English Literature*, New Delhi: OUP India, 1997.

REFERENCE BOOKS

W. H. Hudson. *An Outline History of English Literature*. India, AITBS Publishers, 2013.
Carter, Ronald & McRae, John. *The Routledge History of Literature in English: Britain and Ireland*. Taylor & Francis, 2016.
Compton, Rickett. *A History of English Literature*, UBS Publishers, 2009.

WEB REFERENCES

<https://leverageedu.com/blog/history-of-english-literature>
<https://www.thoughtco.com/british-literary-periods-739034>
<https://literariness.org/2018/07/18/a-brief-history-of-english-literature/>
<https://www.pdfdrive.com/a-history-of-english-literature-e33444148.html>

PEDAGOGY - Group Discussion, Quiz, Assignment and Seminar

COURSE DESIGNER - Dr. R. Vanitha

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester – IV	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UEN4GEC2	COMMUNICATION SKILLS IN ENGLISH	GENERIC ELECTIVE COURSE - II	2	2

COURSE OBJECTIVES

- To equip the students with LSRW Skills to expose them to write and communicate in English
- To enrich their knowledge in vocabulary and making them feel competent and confident to face the global world.
- Language Develop skills to possess flair and fluency in spoken and written English.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Relate the various skills and drill practice of speaking and writing effectively in creating a better self in society.	KI
CO2	Illustrate and interpret vocabulary with meaning by demonstrating roleplays, applying descriptive and narrative techniques of knowing various genres.	K2
CO3	Classify the various skills by letting the learners to avoid errors and speak with fluency.	K2
CO4	Build and apply skills in various situations of framing dialogues and conversation practice	K3
CO5	Analyse to examine reading skills and speaking skills for communicational approach in facing the world for bright opportunities.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	2	3	3	2	3	3	3	3	2	3
CO4	3	3	2	3	3	2	2	2	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Communication: An Introduction, Definition, Nature and Scope of Communication, Importance and Purpose of Communication, Process of Communication, Types of Communication	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Barriers to communication: Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional Barriers Perspectives in Communication: Introduction, Visual Perception, Language, Other Factors Affecting our Perspective - Past Experiences, Prejudices, Feelings, Environment	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Elements of Communication: Introduction, Face to Face Communication – Tone of voice, Body Language (Non-Verbal Communication), Verbal Communication Physical Communication.	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Interview Skills: Purpose of an interview, Do's and Don'ts of an interview Giving Presentations: Dealing with Fears, Planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	Group Discussion: Introduction, Communication Skills in Group Discussion, Group Dynamics, Do's and Don'ts of Group discussion	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-study for Enrichment (Not to be included for End Semester Examination) LSRW Skills, Mock Interview, Socialization, Grammar, Building of Vocabulary, Watching Educational Videos, Conversation	--	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Basic communication skills for Technology, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011

Communication skills, Sanjay Kumar, Pushpalata, 1st Edition, Oxford Press, 2011

Organizational Behavior, Stephen.P. Robbins, 1st Edition, Pearson, 2013

Brilliant- Communication skills, Gill Hasson, 1st Edition, Pearson Life, 2011

The Ace of Soft Skills: Attitude, Communication and Etiquette for success, GopalaSwamy Ramesh, 5th Edition, Pearson, 2013

Developing your influencing skills, Deborah Dalley, Lois Burton, Margaret, Greenhall, 1st Edition Universe of Learning LTD, 2010

Communication skills for professionals, Konar Nira, 2ndEdition, New arrivals –PHI, 2011

Personality development and soft skills, Barun K Mitra, 1st Edition, Oxford Press,2011

REFERENCE BOOKS

Dutt. P.Kirmani, Rajeevan. Geetha, Prakash.CL.N A Course in Communication Skill Foundation

Books New Delhi: Cambridge University Press Ltd,2010

Murphy, Raymond English Grammar in Use Cambridge,2012.

WEB REFERENCES

<https://link.springer.com>

<https://www.sanfountry.com>

PEDAGOGY - Seminar, Roleplay, Quiz and Discussion

COURSE DESIGNER - Ms.J.Vanipriya

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester – IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UEN4SEC1P	PUBLIC SPEAKING (P)	SKILL ENHANCEMENT COURSE – I	2	2

COURSE OBJECTIVES

- Organize ideas in logical patterns that are consistent with the specific purpose of a speech.
- To develop opportunities, to strengthen and prepare the skills needed for public speaking in different situations.
- Recognize what constitutes ethical speaking skills that are consistent with freedom of speech.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENTS	COGNITIVE LEVEL
CO1	Relate and create a positive ambience with the audience through effective communication skills and transform learners into public speakers	K1
CO2	Demonstrate learners' ability to use organizational formats with a clear specific purpose of establishing social networking opportunities	K2
CO3	Identify the problems of stress, and anxiety and overcome fears by instilling confidence and courage to express self-assuredly	K2
CO4	Apply practical skills and knowledge to express with self-confidence and brevity to meet the growing demands of society	K3
CO5	Examine verbal and non-verbal skills, critical thinking and ethical behaviors through individuals, community, and the environment to create a better self and a better world	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	2	3
CO2	3	2	3	3	3	3	3	2	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	2	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Public Speaking Definition - Understanding the Importance of Public Speaking – Benefits - Speaking Competencies - Ethics in Public Speaking Practical for Unit I – Icebreaking Session (Self-Introduction/ Hobbies and Interests) – Fear Busting Exercises – Tongue Twisters	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Speech Delivery Elements: Diction, Grammar, Pronunciation and Fluency - Voice Modulation and Articulation – Methods of Delivery - Body Language - Gestures – Expressions – Usages of ICTs Practical for Unit II – Vocal Exercises - Pitch Variation for a Speech – Dialogue - Creating Stories / Topics – Linking Objects with Stories – Preparing PowerPoint Slides – Presentation Templates	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Types of Speech Types: Informative – Persuasive- Demonstrative – Entertainment – Function, Characteristics and purposes – Speaking Occasions - Role of a Speaker and their Strategies Practical for Unit III – Presentation – Active Listening Exercises – Impromptu – Occasion Speech	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Speech Organising, Outlining Selecting, Analyzing Topics and their Purpose - Structuring a Speech – Brain Storming - Connecting the main points - Organizational Styles - Outlining the Speech – Questioning and Feedback Practical for Unit IV – Role Play- Interviewing the Personality	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	UNIT – V Speech Language and Style The Style of a Speech: Speaker, Audience and Purpose– Using Vivid Language - - Language Pitfalls - Voice Control - Using Professional Language - The Importance of Accurate Language Powerful Public Speeches: Study the Experts – (TED TALKS etc) Abraham Lincoln - Gettysburg Speech Oprah Winfrey - Golden Globe Speech Chimamanda Ngozi Adichie - We should all be Feminists Practical for Unit V: Extempore with Presentation – Debate	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

REFERENCE BOOKS

Lucas, Stephen. The Art of Public Speaking, Edition 7, McGraw Hill. 2001.

Carnagey, Dale, J Esenwein. *The Art of Public Speaking: Masterpiece in Communication*. 2017.

Ferenc, John Searle and Bierwisch, *Speech Act Theory and Pragmatics*. 1980.

Hernández, Lorena Pérez. *Speech Acts in English: From Research to Instruction and Textbook Development*, 2020

[https://socialsci.libretexts.org/Bookshelves/Communication/Public_Speaking/Public_Speaking_\(The_Public_Speaking_Project\)/08%3A_Organizing_and_Outlining](https://socialsci.libretexts.org/Bookshelves/Communication/Public_Speaking/Public_Speaking_(The_Public_Speaking_Project)/08%3A_Organizing_and_Outlining)

WEB REFERENCES

https://www.ted.com/talks/chimamanda_ngozi_adichie_we_should_all_be_feminists?language=en

<https://ted.com/why-oprahs-talk-works-insight-from-a-ted-speaker-coach/>

https://ed.ted.com/best_of_web/4Tpzh53v

PEDAGOGY - Group Discussion, Activity and Assignment

COURSE DESIGNER - Dr. R. Vanitha

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

SEMESTER – V



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.
PG DEPARTMENT OF ENGLISH
BA ENGLISH - Programme Structure
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the Candidates admitted from the Academic Year 2022 – 2023 onwards)

SEMESTER - V

Semester	Part	Course	Course Title	Course Code	Inst. Hrs / Week	Credits	Exam			Total
							Hours	Marks		
								Int	Ext	
V	III	Core Course - IX (CC)	Shakespeare	22UEN5CC9	6	6	3	25	75	100
		Core Course - X (CC)	Principles of Literary Criticism	22UEN5CC10	5	5	3	25	75	100
		Core Course - XI (CC)	American Literature	22UEN5CC11	5	5	3	25	75	100
		Core Course - XII (CC)	Women’s Writing in English	22UEN5CC12	5	5	3	25	75	100
		Discipline Specific Elective - I (DSE)	A. Diasporic Literature	22UEN5DSE1A	5	4	3	25	75	100
			B. Translation: Theory and Practice	22UEN5DSE1B						
			C. World Classics in Translation	22UEN5DSE1C						
	IV	Ability Enhancement Compulsory Course - IV (AECC)	UGC – Jeevan Kaushal Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course - II (SEC)	English for BPO	22UEN5SEC2	2	2	3	25	75	100
		Extra Credit Course		SWAYAM	As per UGC Recommendations					
Total				30	29				700	

SIGNATURE		
NAME & DESIGNATION	Dr. S. Jayashree Agarwal UG - HOD	Dr. N. Savithri Dean

Semester -V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UEN5CC9	SHAKESPEARE	CORE COURSE – IX	6	6

COURSE OBJECTIVES

- To introduce the dramatic techniques to the learners.
- To make the learners understand the characterization, dramatic and poetic techniques in Shakespearean plays.
- To enhance the learner's appreciation of select plays of Shakespeare

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Relate and recall details of the Age of Shakespeare and his works	K1
CO2	Demonstrate the settings of Shakespearean Theatre	K2
CO3	Identify the aesthetics and uniqueness of Shakespeare both as a dramatist and poet for higher learning.	K3
CO4	Built the characters portrayed by Shakespeare to be explored in-depth for better prospects	K3
CO5	Analyse the style and techniques of Shakespearean Plays	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	2	2	2
CO2	3	2	3	2	2	3	2	3	2	2
CO3	2	2	2	2	2	2	2	2	2	2
CO4	2	2	2	3	2	2	2	2	3	2
CO5	2	2	2	2	2	2	2	2	2	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Shakespearean theatre and audience. Supernatural elements in Shakespearean plays. Shakespearean Soliloquies.	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Sonnets: 53, 104, 116,130	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	<i>Hamlet</i>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	<i>Julius Caesar</i>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	<i>The Tempest</i>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-study For Enrichment (Not to be Included for End Semester Examination) <i>A Midsummer Night's Dream.</i>		CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Shakespeare, William. *The Complete Works of Shakespeare*. Wilco Publishing House, 2018.

REFERENCE BOOKS

AC.Bradely. *Shakespearean Tragedy: Lectures on Hamlet, Othello, King Lear, Macbeth*. Macmillan and Co, 1905.

H.B.Charlton . *Shakespearean Comedy*. London: Mathew,1938

Boris Ford. *The Age of Shakespeare*. Penguin Books, 1982.

WEB REFERENCES

<http://shakespeare.mit.edu/tempest/full.html>

<https://shakespeare.folger.edu/shakespeares-works/julius-caesar/entire-play/>

<https://www.shakespeare.org.uk/explore-shakespeare/shakespedia/shakespeares-plays/as-you-like-it/>

PEDAGOGY - Group Discussion, Assignments, Quiz

COURSE DESIGNER - Ms. K. Kanimozhi

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester – V	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UEN5CC10	PRINCIPLES OF LITERARY CRITICISM	CORE COURSE - X	5	5

COURSE OBJECTIVES

- To identify the difference and the advancement in critical terms and concept - from classical criticism to the present age.
- To enable the learners use critical tools and demonstrate the critical understanding of literary criticism.
- To appreciate various approaches in literary criticism.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Relate the mode of criticism in literary works.	K1
CO2	Interpret the literary texts with the given criticism	K2
CO3	Illustrate the features of literary text with reference to literary criticism for higher learning.	K2
CO4	Apply various literary approaches in literary works	K3
CO5	Analyze the critical works of art for higher learning and better prospects.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	2	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	2	3
CO5	3	3	3	2	3	3	3	3	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Plato - Theory of Ideas, Indictment of Poetry Aristotle – Six Elements of Tragedy Horace Precepts concerning the Art of Poetry and Drama Longinus - On the Sublime –Definition – True and False Sublime - Distinction between True and False Sublime	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Sir Philip Sidney - An Apology for Poetry Samuel Johnson - Preface to Shakespeare	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	William Wordsworth – Preface to Lyrical Ballads Mathew Arnold – The Study of Poetry	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	T.S. Eliot – Tradition and Individual Talent M.H. Abrams - Orientation of Critical Theories	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	Five Approaches to Literary Criticism: Moralistic Approach, Psychological Approach, Sociological Approach, Formalistic Approach and Archetypal Approach	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-study For Enrichment (Not to be Included for End Semester Examination) Alexander Pope - An Essay on Criticism S.T. Coleridge - Biographia Literaria (Chapter XIV)	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Mundra Sc, Agarwal Sc. *Principles & History of Literary Criticism*. Prakash Book Depot, 2009.
 Scott, Wilbur. *Five Approaches of Literary Criticism*. Macmillan, 1963.
 Dryden, John. *An Essay on Dramatic Poesy*. OUP, 1918.

REFERENCE BOOKS

Enright & de Chickera. *English Critical Texts*. OUP, 1975.
 Rafey Habib. *A History of Literary Criticism: from Plato to the Present Halden*. Blackwell Publishing Ltd, 2005.
 S. Joesph Arul. Jayraj, S. Paul Pragash & M. John Britto. *Literary Criticism*. Lambert Academic Publishing, 2010.
 Birjadish Prasad. *An Introduction to English Criticism*. Macmillan India Ltd, 1965.

WEB REFERENCES

<https://drdevika.files.wordpress.com/2017/08/abrams-orientation-of-critical-theories.pdf>
http://socrates.acadiau.ca/courses/engl/rcunningham/Winter2020/engl5013_poetics/texts/eliot_tradition.pdf
http://www.letras.ufmg.br/padrao_cms/documentos/profs/marcel/LyricalBallads.pdf
<http://public-library.uk/pdfs/8/865.pdf>
http://www.letras.ufmg.br/padrao_cms/documentos/profs/marcel/LyricalBallads.pdf
https://www.sas.upenn.edu/~cavitch/pdf-library/Arnold_Study.pdf

PEDAGOGY - Group Discussion, Quiz, Assignment

COURSE DESIGNER - Ms. P.K. Durgadevi

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester – V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS /WEEK	CREDITS
22UEN5CC11	AMERICAN LITERATURE	CORE COURSE - XI	5	5

COURSE OBJECTIVES

- Identify representations of American authors and works, significant historical or cultural events.
- Analyze American literary works of individuals and communal values within social, political, religious contexts of different literary periods.
- Develop an understanding of the progress of American characteristic forms or styles of expression in different periods.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Relate the understanding about American Transcendentalism.	K1
CO2	Illustrate the key ideas and works with major and minor poets of America.	K2
CO3	Interpret the American history and social conditions with the referred text for higher learning.	K2
CO4	Construct to develop the literary dramas in terms of cultural and social issues.	K3
CO5	Analyse the elements such as imagery, theme, motif & style in literature for critical and for better prospects.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	2	3	3	3	3	2	3	3	3	3
CO4	3	3	3	2	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	POETRY Emily Dickinson -. Success is Counted Sweetest James Russell Owen - The Cathedral Sylvia Plath - Mirror	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	PROSE Edgar Allan Poe – Philosophy of Composition Martin Luther King - I Have a Dream	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	SHORT STORY Mark Twain – Ghost Story James Thurber – Secret Life of Walter Mitty	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	DRAMA Samuel Shepard - <i>Curse of Starving Class</i> Arthur Miller – All My Sons	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	FICTION Earnest Hemingway - <i>The Old Man and the Sea</i> Toni Morrison – <i>The Bluest Eye</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-study For Enrichment (Not to be Included for End Semester Examination) Reading from Emily Dickinson: Hope is the thing with feathers Robert Frost - Best Running Brooks. Nathaniel Hawthorne - The Scarlet letter John Steinbeck - The Grapes Of Wrath.	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Hemingway, Earnest, *The Old Man and the Sea*, RHUK, 1994

Shepard, Sam, *Curse of the Starving Class*, Dramatists Play service, INC

Wolfe, Thomas, *The Complete Short Stories of Thomas Wolfe*, Collier Books, 1989.

REFERENCE BOOKS

Fisher, William J, K B. Vaid, H. Willard Reninger and Relph Samuelson. *American Literature of the Nineteenth Century: An Anthology*. Eurasia.

Hawthorne, Nathaniel. *The Scarlet Letter*. Maple Press 2010.

Ellison, Ralph Waldo. *Invisible Man*. Penguin UK, 2009.

Das, Ajay. *Great American Poets*. First Edition, Bhasker Publications, 2010. Subbian, c. *American Literature: An Anthology of poems*. Emerald Publishers, 2010.

WEB REFERENCES

Poetry Foundation, Poetry Foundation, www.poetryfoundation.org/.

“English and American Literature:” Home – SCSU Research Guides at Southern Connecticut State University, 24Apr.2000, libguides.southernct.edu/.

“American Literature; A Research & References Guide: Primary Resources.”

Research Guides, 25 Aug 199, research.lib.buffalo.edu/American-literature-research/primary-sources.

PEDAGOGY - Group Discussion, Seminar, Quiz and Assignment.

COURSE DESIGNER - Ms. Irudhaya Pushpam. M

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester - V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UEN5CC12	WOMEN'S WRITING IN ENGLISH	COURE COURSE - XII	5	5

COURSE OBJECTIVES

- To enrich the knowledge of women's lives in the global world as silent sufferers, toil, pain and the atrocities faced by men.
- To enhance and empower women's literature and understand feminism from social and cultural background of the society.
- To differentiate and appreciate the works of women writers of various countries and ages.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Recall and relate the woes and miseries faced by women with emphasis on class, race, gender in the world.	K1
CO2	Illustrate and interpret the difficulties of women and empowerment	K2
CO3	Identify the problems and highlight solutions by education and empowerment for higher learning.	K3
CO4	Compare and contrast the lives of the women in today's world and the past.	K4
CO5	Analyse the works of the women writers with critics thinking and empower with moral and social responsibility aiming for better future.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	3	3	3	3	2	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	2	2	2	3	3	2	3	3	2	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	2	3	3	2	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Poetry Maya Angelou – I Know why the Caged Bird Sings Sylvia Plath - Poppies in October Christina Rosetti - Remember	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Prose Chi Alice Munro - Boys and Girls Chimamanda Ngozi Adichie – We Should All Be Feminist	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Short Stories Virginia Woolf - The Mark on the Wall Kate Chopin - The Story of an Hour	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Drama Lorraine Hansberry- <i>A Raisin in the Sun</i> Susan Glaspell - <i>The Outside</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	Fiction Doris Lessing - <i>The Grass is Singing</i> Maggie O Farrell - <i>The Marriage Portrait</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-study For Enrichment (Not to be Included for End Semester Examination) Alice Munro's <i>Save the Reaper</i> , Kamala Das's <i>The Losing Battle</i> Susan Glaspell <i>Trifles</i> , Character Sketch, Themes	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Angelou, Maya. *I Know Why the Caged Bird Sings*. Random House, 2009.

Adichie, Chimamanda Ngozi. *We Should All Be Feminists*. 2014.

Chopin, Kate. "The Story of an Hour." *The Norton Introduction to Literature*, edited by Kelly J. Mays, shorter 14th ed., W. W. Norton, 2022.

REFERENCE BOOKS

Bauermeister, Erica. *500 Great Books by Women Writers: A Reader's Guide*. Penguin, 1994.

WEB REFERENCES

<https://allpoetry.com/Poppies-In-October>

<https://nmi.org/wp-content/uploads/PublicDomain/TheOutsideDrama.pdf>

https://en.wikipedia.org/wiki/List_of_Maya_Angelou_works

<https://www.litcharts.com/lit/a-raisin-in-the-sun/summary>

<https://www.supersummary.com/the-marriage-portrait/summary/>

PEDAGOGY - Group Discussion, Debate, Paper presentation, Extensive reading, Seminar with PPT

COURSE DESIGNER - Ms. A. Edel Flora Mary

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester – V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UEN5DSE1A	DIASPORIC LITERATURE	DISCIPLINE SPECIFIC ELECTIVE - I	5	4

COURSE OBJECTIVES

- Expose the students to the Diasporic life and experience.
- Make the students aware of the process of emigration and the impact of cultural displacement.
- To enhance the learners, understand and infer Diasporic Literature from the representative works.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Relate the elements of alienation, quest of identity and displacement and disintegration of cultures in real life.	K1
CO2	Compare and contrast the concern of individual's community attachment to the homeland and the new land from social cultural background.	K2
CO3	Identify to explore the mass migration in search of work, economic status, values and cultures for higher learning.	K3
CO4	Apply knowledge of critical thinking sensitivity to regional and global perspectives to identify and solve problems.	K3
CO5	Analyse cross cultural issues of migrations, loss of homeland, resettlement struggle of the inner mind for enrichment of ideas for better prospects.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	3	3	2	3	3	3	2	3
CO3	2	3	3	3	2	3	3	3	2	3
CO4	3	3	2	3	3	3	3	3	3	3
CO5	3	3	3	2	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Definition of the terms “Diaspora”– Birth of Diasporic Literature and its Modern Meaning– Colonialism and Diaspora –Classification of “Diaspora”. Concept of Diaspora, Ethnicity, Issues of location, Nostalgia and Memory Loss Cultural Hybridism	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Poetry Rick Barot- Bonnard’s Garden Imtiaz Dharker -The Right Word	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Short Story Jhumpa Lahiri- This Blessed house (Interpreter of Maladies, Chapter VII) Chitra Banerjee Divakaruni- Clothes (Arranged Marriage, Chapter II)	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Drama David Henry Hwang- M. Butterfly	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	Novel Salman Rushdie - <i>Midnight’s Children</i> Bharathi Mukerji - <i>Tiger’s Daughter</i>	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-study For Enrichment (Not to be Included for End Semester Examination) Self-identity, Expatriation, Exuberance of Immigration, Hybridity, Nostalgia for Home Displacement, Rootlessness	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

John, B. Alphonso - Karkala. Indo- English Literature in the Nineteenth Century. Mysore, 1970. Print.
Peeradina, Saleem. Ed. Contemporary Indian Poetry in English: An Assessment and Selection. Chennai: Macmillan Pub. Pvt. Ltd. 2010. Print

REFERENCE BOOKS

Cohen, Robin 1997. Global Diaspora: An Introduction. London: UCL Press. [Introduction] Eleonore Kofman, Annie Phizacklea, Parvati Raghuram, Rosemary Sales. 2000. Gender and International Migration in Europe: Employment, Welfare and Politics. London: Routledge. [Introduction].
Jain, Jasbir. *Writers of the Indian Diaspora*. Delhi: Rawat Publications, 2003. Print.
Lal, Brijvilash. *The Encyclopedia of the Indian Diaspora*. Delhi: Oxford University Press, 2006. Print.
Natarajan, Nalini. *Handbook of Twentieth-Century Literatures of India*. Delhi: Greenwood Publishing Group, 1996. Print.

WEB REFERENCES

http://shodhganga.inflibnet.ac.in/bitstream/10603/85357/8/08_chapter2.pdf
<https://www.bing.com/search?q=tiger%27s+daughters&form=ANNT11&refig=8e7cc5f175e54e2aa8ba741b45080bb7&sp=2&lq=0&q=HS&pq=ti&sk=HS1&sc=10-2&cvid=8e7cc5f175e54e2aa8ba741b45080bb7>

PEDAGOGY - Group Discussion, Debate, Paper presentation, Extensive reading, Seminar with PPT

COURSE DESIGNER – J. Vani Priya

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester - V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UEN5DSE1B	TRANSLATION: THEORY AND PRACTICE	DISCIPLINE SPECIFIC ELECTIVE - I	5	4

COURSE OBJECTIVES

- To provide students with a thorough knowledge of the history of translation and its issues.
- To verify the validity and applicability of the theoretical paradigms through the analysis of a number of existing translations.
- To identify and highlight the comparative differences in literary traditions through the linguistic and literary analysis of original and translated texts.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Define various theories of translation and apply in translation by possessing thorough knowledge	K1
CO2	Illustrate the relationship between theory & practice of some text by applying scientific and social approaches	K2
CO3	Construct knowledge of historical development of translation theory and translating classics from Source Language to Target Language for research and higher learning	K3
CO4	Analyse the knowledge of various views of translation theorists, problems faced by the translators in Prose, Poetry, Drama and other genres to solve various problems	K3
CO5	Examine concepts of translation principles and methods in translating one text to another as in Thirukkural for personal and societal development for better prospects	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	3	3	2	3	3
CO2	3	3	3	3	3	3	3	2	3	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	2	3	2	3	3	2	2	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Define Translation - History of Translation- History of Translation in India- Do's and Don'ts of Translation- Scope of Translation Studies	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Dryden on Translation- J.C. Catford's view on Translation- Eugene Nida- Peter Newmark- Susan Bassnett- Theodore Savory	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Types of Translation- Methods of Translation- Principles of Translation- Principles of Translator	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Equivalence- Untranslatability- Translation of Poem- Translation of Prose- Translation of Drama	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K
V	N. Kalyana Raman - <i>The Story of a Black Goat</i> Thirukkural Chapter LXXIX, LXXXII & LXXXIII	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-study For Enrichment (Not to be Included for End Semester Examination) Translating verse translation in Thirukkural, Paragraph Translation based on Comprehension Passages, Translation of Roman Jakobson, Mc-Guire, Horst Frenz, Translation of Bharathiyar Poems, Perumal Murugan - <i>Poonachi</i>	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Bassnett-McGuire, Susan. Translation Studies. New York: Methuen & Co., 1980.
 Catford, J.C. A Linguistic Theory of Translation. London: Oxford University Press, 1974.
 Lefevere, André. Translating Literature: Practice and Theory in a Comparative Literature Context. New York: Modern Language Association, 1992.
 Newmark, Peter. Approaches to Translation. Oxford: Pergamon Press, 1988.
 Steiner, George. After Babel. New York and London: Oxford University Press, 1975, 3rd edition 1999

REFERENCE BOOKS

Bassnett-McGuire, Susan., and André Lefevere, eds. Translation, History and Culture. London: Pinter Publishers Limited, 1991.
 Belloc, Hilaire. On Translation. Oxford: Oxford University Press, 1931.
 Savory, Theodore. The Art of Translation. Boston: The Writer Inc., 1968
 Frost, William, ed. Dryden and the Art of Translation. New Haven: Yale University Press, 1955.

WEB REFERENCES

www.logos.net

www.cattranslation.org

<http://www.lai.com/companion.html>

<http://www.mcelhearn.com/lit.html>

<http://fuzzy.arts.kuleuven.ac.be/cetra/people.htm>

<http://www.erudit.org/erudit/meta/> Meta

<http://www.translatum.gr/trjournal.ht>

[Chapter 79 : Friendship | Thirukkural in English \(wordpress.com\)](#)

[Chapter 82: Adverse friendship | Thirukkural in English \(wordpress.com\)](#)

[Chapter 83: Undesirable friendship | Thirukkural in English \(wordpress.com\)](#)

PEDAGOGY - Group Discussion, Quiz, Assignment, Translation Practice

COURSE DESIGNER - Ms. A. Edel Flora Mary

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester - V	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UEN5DSE1C	WORLD CLASSICS IN TRANSLATION	DISCIPLINE SPECIFIC ELECTIVE - I	5	4

COURSE OBJECTIVES

- To introduce the learners the World's best Classics in translations.
- To generate a broad vision of life by making the learners gain an understanding of early human experiences, the universal problems and varied life situations.
- To enable the learners to excel in learning various genres such as poetry, fiction, short stories and drama of World Classics.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Relate to recall the contemporary relevance with World Classics	K1
CO2	Illustrate a deep insight into the famous Classical Poems and Epics and cultivate judicious appreciation.	K2
CO3	Apply the knowledge gained to various real-life situations and human experiences for higher learning.	K3
CO4	Analyse the preliminary understanding of the Classical literature.	K4
CO5	Examine and correlate the ideals to one's own life and in various situation for higher learning.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	2	3	2	3	2	2	3
CO2	3	3	2	2	3	3	3	2	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	2	3	2	2	3	2	3	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Poetry: Kalidasa - “Megha Duta or the Cloud Messenger” (Argument and Lines 01-48) Dante Alighieri - “The Gate of Hell” : Canto III (Inferno) Bertolt Brecht - “The Burning of the Books” Anna Akhmatova - “Lot’s Wife” Tao Yuanming - “Returning to Live in the Country”	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Prose: Introduction to Greek Classical Literature A.K.Ramanujan - 'On Ancient Tamil Poetics'	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Drama: Sophocles - Oedipus Rex	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Short Story: Alexander Pushkin - “The Blizzard” Guy de Maupassant - “The Convert” Leo Tolstoy - “The Empty Drum” Fyodor Dostoyevsky - “A Christmas Tree and a Wedding”	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	Fiction: Alexander Dumas - The Count of Monte Cristo	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-study For Enrichment (Not to be Included for End Semester Examination) Gothe - The Reunion Hermann Hesse - Siddhartha Dostoevsky - Notes from Underground Maxim Gorky - One Autumn Night Bhasha - Karnabharam Miguel Cervantes - Don Quixote Henrik Ibsen - A Dolls House	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

The Odyssey by Homer -Penguin Classics

Indian Literary Criticism, G.N. Devy. Orient Black Swan (pg 346-374)

The Mégha Dúta, Or, Cloud Messenger: A Poem, in the Sanskrit Language. Calcutta: Trans. by Horace Hayman Wilson-1813.

Texts and their Worlds- II - K.Narayana Chandran, Foundation Books, 2005

The Theban Plays by Sophocles - Penguin Classics

Masterpieces of World Fiction: Selected Stories by Guy De Maupassant

Selected Stories by Leo Tolstoy (Masterpieces of World Fiction)

REFERENCE BOOKS

World Literature Reader: A Reader - edited by Theo D'haen, César Domínguez, Mads Rosendahl Thomsen
Reading World Literature: Theory, History, Practice - edited by Sarah Lawall
A History of Western Literature –J.M.Cohen
1789: The French Revolution Begins. - Blackman, R. Cambridge University Press.
A History of European Literature: The West and the World from Antiquity to the Present.- Walter Cohen Edinburgh University Press
Modernism: A Guide to European Literature. 1890-1930. Malcolm Bradbury and James McFarlane. Penguin.

WEB REFERENCES

<https://www.poetrynook.com/poem/returning-live-country>
<https://www.poetryfoundation.org/poems>
<https://archive.org/details/mghadtaorcloudm00wilsgoog/page/n136/mode/2up>
<https://www.thefreshreads.com/the-blizzard/>
<https://www.berfrois.com/2013/12/two-christmas-short-stories-fyodor-dostoyevsky/>
<https://www.britannica.com/art/Greek-literature/Classical-period-5th-and-4th-centuries-bc>
<https://www.thoughtco.com/inferno-canto-iii-divine-comedy-dante-alighieri-4098791>
<https://www.britannica.com/biography/Sophocles>
<https://www.britannica.com/art/French-literature/The-reaction-against-reason>
<https://www.britannica.com/art/Russian-literature>

RECOMMENDED MOOC

NPTEL: Introduction to World Literature <https://nptel.ac.in/courses/109/106/109106147/>
edX- Harvard University: Modern Masterpieces of world Literature
<https://www.edx.org/course/modern-masterpieces-of-world-literature>

TED TALKS

Why Read the Classics? Valdir Chagas | TEDxYouth@ACS
<https://www.youtube.com/watch?v=Ss36LZ5xoPA>
What if everyone had a classical education? | Rebekah Hagstrom | TEDxMahtomedi
<https://www.youtube.com/watch?v=0m5yDZCy2pE>

PEDAGOGY - Quiz, Assignment, Activity, Powerpoint Presentation

COURSE DESIGNER – Ms. S. Ramalakshmi

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester - V	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UGPS	UGC - JEEVAN KAUSHAL PROFESSIONAL SKILLS	ABILITY ENHANCEMENT COMPULSORY COURSE – IV	2	2

COURSE OBJECTIVES

- To prepare students to become viable entrepreneurs or employees with necessary professional skills with sound knowledge of Indian and Tamil Culture and Heritage.
- To enhance the comprehensive skills required for a work environment leading them competent and confident.
- To motivate the learners to excel in a challenging environment for organization and personal growth with a professional touch

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENTS	COGNITIVE LEVEL
CO1	Relate and define communication skills in good technical writing, presentation skills with professional touch.	K1
CO2	Develop confidence and competence in professional skills to understand ambitions and goals to achieve the target.	K2
CO3	Build professional skills with a practical approach and enhance critical thinking abilities in various situation of life for lifelong learning.	K3
CO4	Examine the cultural heritage of Tamil Nadu and India to develop an understanding of cultural nuances and practices, to navigate diverse workplaces with sensitivity and respect.	K4
CO5	Analyze the acquired skills to pursue successful career path with an assertive attitude for better prospects in the global world.	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	2	3
CO2	3	3	3	3	3	3	3	2	2	3
CO3	3	3	2	3	3	3	3	3	3	3
CO4	3	3	3	2	2	3	3	3	2	3
CO5	3	3	3	2	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Resume Skills Preparation and Presentation. Avoiding Common Errors in Resume Writing Preparing Resumes for Specific Purposes	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Interview Skills Useful Vocabulary Preparation and Presentation. Avoid Fear and Stress Observation of a Simulated Interview	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Body Language and Personal Grooming Importance of Body Language Postures, Eye Contact, Expressions & Etiquette Good Grooming is Being Clean	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Social and Cultural Etiquette Existing Traditional Tamil and Indian Culture Introduction to Tamil Culture Introduction to Indian Culture and Etiquette Pls. Note: (Subjected to inclusions based on the requirements of the respective disciplines) Good Manners and Etiquette Table Manners Manners in Public Places	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Group Discussion Skills Meaning and Methods of Group Discussion. Procedure of Group Discussion. The Do's and Don'ts of a Group Discussion Assessment Criteria	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Time Management - Personality Development - Problem Solving - Public Speaking - Leadership Skills	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

TEXT BOOK

A Handbook of Professional Skills by Dr. Rita Shanthakumar and Dr. S. Jayashree Agarwal

REFERENCE BOOKS

Gorden. L Raymond, *Basic Interviewing Skills*, Waveland Press, Inc, US, 1992

Dr. Rashmi Achmare, Handbook of Communication Skills for Professional Students, Publisher: IPH
Edition: First-2021

WEB REFERENCES

[https://graphicdesign.sfcc.spokane.edu/dZine/projects/Q3- typographic resume/resume_basics.pdf](https://graphicdesign.sfcc.spokane.edu/dZine/projects/Q3-typographic%20resume/resume_basics.pdf)

[http://worldwideuniversity.org/library/bookboon/the-art- of-interview-skills.pdf](http://worldwideuniversity.org/library/bookboon/the-art-of-interview-skills.pdf)

https://www.tutorialspoint.com/positive_body_language/positive_body_language_tutorial.pdf

<http://egyankosh.ac.in/bitstream/123456789/35846/5/Unit-10.pdf>

https://www.etiquettescholar.com/dining_etiquette/table_manners.html

http://languagemanuals.weebly.com/uploads/4/8/5/3/4853169/final_tamil_manual.pdf

PEDAGOGY - Seminar, Simulation Quiz and Assignment

COURSE DESIGNER - Dr. Rita Shanthakumar and Dr. S. Jayashree Agarwal

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

Semester - V	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UEN5SEC2	ENGLISH FOR BPO	SKILL ENHANCEMENT COURSE – II	2	2

COURSE OBJECTIVES

- To enable students to learn the significance of communication in business.
- To help them expand their vocabulary related to different business communications.
- To make them learn the techniques of interviews and group discussion.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Relate the learner's ability to use grammar both in spoken and written form.	K1
CO2	Explain the basic grammar used in constructing a sentence as well as in speaking.	K2
CO3	Develop their speaking ability in English, both in terms of fluency and comprehension.	K3
CO4	Inspect their reading speed and comprehension level.	K4
CO5	Examine their correct usage of English grammar in speaking and writing	K4

MAPPING OF CO WITH PO AND PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	2	3	3	3	2	2	3	3	3
CO3	3	2	2	3	3	3	3	3	3	3
CO4	3	3	2	3	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introductory Session Introducing BPO The importance of English for BPOs Skills required for BPOs	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	Accent Neutralization Pronunciation of consonants and vowels Intonation and stress Basics of British and American Accents	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Emphasis on LSW Skills Listening Process and Comprehension Practice Accent Training, Voice Modulation and Short Conversation Practice Transcription (Listening and Converting into Text) and Error Correction	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Personality Enhancement Avoiding Nervousness and Building Confidence Body Language Telephone Etiquettes Mock Call Practice	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	Preparation for the Interview Interview Process at BPOs and Various Job Interview Rounds Listening and Answering the Queries Preparing for the personal interview	6	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-Study for Enrichment (Not to be included for the End Semester Examination) Smart Skills for the Job Market Resume Formatting The most Common Mistakes made in Group Discussions Mirror Practice	--	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

TEXT BOOKS

Kulkarni, Sarika. *Business Process Outsourcing*. Jaico Publishing House, Dehi. 2005.
Binkowskl, Donna Deans. *Learn to Speak English (Work book)*. BPP Publication. 2005.
W.W.S Bhaskar and N.S.Prabhu *English Through Reading* Macmillan:India,2008.

REFERENCE BOOKS

John Laguna. *College Writing Skills*, media edition. London: Macmillan,1998, Print.
Baug H. L.S., Frayer. M., Thomas. D., *Handbook for Business Writing*. NTC Business Books:Illinois, 1987.
Thomas Elliott Berry *The Most Common Mistakes in English Usage*, Tata McGraw-Hill, India,2007.
Alex.K. *Soft Skills*, New Delhi:S.Chand and Company Ltd, 2009.

WEB REFERENCES

<https://pdfroom.com/books/learn-to-speak-english-deluxe-workbook/0K2ll8Yz2ap>
<https://www.javatpoint.com/group-discussion#:~:text=Group%20Discussion%20GD%20is,group%20represents%20his%2Fher%20perspective.>
<https://www.businessnewsdaily.com/3207-resume-writing-tips.html>

PEDAGOGY - Activity, Classroom interaction, Role play, Group discussion

COURSE DESIGNER - Ms. N.Yoga

SIGNATURE OF THE COURSE DESIGNER

SIGNATURE OF THE HOD

CAUVERY COLLEGE FOR WOMEN, (AUTONOMOUS)

NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC

ISO 9001:2015 CERTIFIED TIRUCHIRAPPALLI

PG DEPARTMENT OF ENGLISH



M.A ENGLISH

SYLLABUS

SEMESTER II

2023-2024 AND ONWARDS

**CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS,
PG DEPARTMENT OF ENGLISH**

VISION

- The Department of English envisions the learners to explore and empower LSRW skills thereby gaining competency in various genres of literature across the world.
- Ensuring the aesthetic sensibility and creativity of the learners for higher pursuits in research and professional career.

MISSION

- Procure academic excellence by mastering language and literature, imbibe human values embedded with personality enrichment.
- To gratify the needs of employability and enshrine learners as socially responsible citizens.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	STATEMENTS
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR MA ENGLISH

POs	On completion of MA English, the students will be able to
PO1	Exhibit comprehensive knowledge in understanding the issues and problems that arise in the society and apply in life circumstances. (Social Responsibility)
PO2	Achieve in-depth knowledge in various genres of literary texts to contribute the best for the society and to create a better world. (Exploring Success)
PO3	Perceive leadership skills through higher learning and be a visionary to achieve the target. (Professional Competence)
PO4	Identify appropriate resources required for research projects to explore novel ideas to gain real-life experience through internships and higher studies. (Discover Innovations)
PO5	Create a scientific attitude and aptitude to undertake research studies for higher learning and career opportunities. (Build Scientific Temperament)

PROGRAMME SPECIFIC OUTCOMES FOR MA ENGLISH

PSO No.	Students of MA English will be able to	POs Addressed
PSO 1	Evaluate literature through politics, environment, society, values, gender and sociological perspectives in reality	PO1
PSO 2	Analyze cognizance to classify the perspectives of English Language and Literature, genres and literary styles of various literatures across the world.	PO1 PO2
PSO 3	Examine writers and their literary works through literary devices and theoretical approaches for professional growth.	PO3
PSO 4	Explore deep insights of literature through hands on experience in research studies enriching critical thinking and creativity.	PO4 PO5
PSO 5	Empower language, linguistics and literature for professional development, crack competitive examinations and to build employability skills.	PO5



Cauvery College for Women (Autonomous), Trichy-18
PG Department of English
M.A Programme Structure
(For the Candidates admitted from the Academic year 2023-2024 onwards)

I Semester (TANSCHÉ)

Semes	Course	Course Title	Course Code	Inst.	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course – I (CC)	English Poetry - From Chaucer to 20th Century	23PEN1CC1	6	5	3	25	75	100
	Core Course – II (CC)	English Drama	23PEN1CC2	6	5	3	25	75	100
	Core Course –III (CC)	English Fiction	23PEN1CC3	6	5	3	25	75	100
	Core Course - IV (CC)	Indian Writing in English	23PEN1CC4	6	5	3	25	75	100
	Discipline Specific Elective Course-I (DSE)	A. Theatre Art	23PEN1DSE1A	6	3	3	25	75	100
		B. Rhetoric& Stylistics	23PEN1DSE1B						
		C. Technical English	23PEN1DSE1C						
Total			30	23				500	

15 Days INTERNSHIP during Semester Holidays

II Semester

Semester	Course	Course Title	Course Code	Inst.	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
II	Core Course– V (CC)	British Literature	23PEN2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Translation Theory & Practice	23PEN2CC6	6	5	3	25	75	100
	Core Course – VII(CC)	American Literature	23PEN2CC7	6	5	3	25	75	100
	Core Choice Course– I (CCC)	A. Literary Theory and Criticism	23PEN2CCC1A	6	4	3	25	75	100
		B. Commonwealth Literature	23PEN2CCC1B						
		C. Skill Enhancement	23PEN2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A. English Language Teaching	23PEN2DSE2A	6	3	3	25	75	100
		B. Post-Colonial Studies	23PEN2DSE2B						
		C. Branches of Linguistics	23PEN2DSE2C						
	Internship		23PEN2INT		02				100
	Extra Credit Course	SWAYAM		As per UGC Recommendation					
	Total			30	24				600

SEMESTER II



Cauvery College For Women (Autonomous), Trichy - 18.

MA- Programme Structure

(For the Candidates admitted from the Academic year 2023 -2024 onwards)

II SEMESTER

Semester	Course	Course Title	Course Code	Inst.	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
II	Core Course– V (CC)	British Literature	23PEN2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Translation Theory& Practice	23PEN2CC6	6	5	3	25	75	100
	Core Course – VII(CC)	American Literature	23PEN2CC7	6	5	3	25	75	100
	Core Choice Course– I (CCC)	A. Literary Theory and Criticism	23PEN2CCC1A	6	4	3	25	75	100
		B. Commonwealth Literature	23PEN2CCC1B						
		C. Skill Enhancement	23PEN2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A. English Language Teaching	23PEN2DSE2A	6	3	3	25	75	100
		B. Post-Colonial Studies	23PEN2DSE2B						
		C. Branches of Linguistics	23PEN2DSE2C						
	Internship		23PEN2INT		02				100
	Extra Credit Course	SWAYAM		As per UGC Recommendation					
Total			30	24				600	

Signature		
Name & Designation	Dr. P.Urmila PG Head	Dr. N. Savithri Dean of Arts

SEMESTER II	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PEN2CC5	BRITISH LITERATURE	CORE COURSE-V(CC)	6	5

Course Objectives:

- To provide students with the critical faculties necessary in an academic environment, on the job, and in an increasingly complex, interdependent world.
- To enable the students to critically analyze research in criticism of literary and cultural texts from different historical periods and genres.
- To assist students in the development of intellectual flexibility, creativity, and cultural literacy so that they may engage in life-long learning.

Pre requisite:

- Basic knowledge in Social History of England and History of English Literature with an additional knowledge of British Literature I

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Compare and appreciate the traditional and modern works of literature through society.	K1,K2, K3,K4
CO2	Examine the style, theme, tone, image and symbolism used in works across.	K1,K2, K3,K4
CO3	Defend the influence of socio-historical factors and the representation of their age in the texts.	K1,K2, K3,K4,K5
CO4	Appraise the depth and diversity of British Literature before and after the World Wars	K1,K2, K3,K4,K5
CO5	Construct comparisons with various Literary Movements to deconstruct texts with greater clarity for higher learning.	K1,K2, K3, K4,K5,K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	2	3	2	3	3	3	2
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	2	3	3	3	3	2	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	POETRY: William Cowper - Joy and Peace in Believing William Collins - Ode to Evening Alfred Tennyson - The Charge of the Light Brigade Warsan Shire - Home Key Concepts: Romanticism, Erotism, Abbey Theatre, Symbolism, Surrealism, Modernism	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	PROSE: Francis Bacon - Of Travel, Of Superstition, Of Marriage Virginia Woolf - On a Faithful Friend Key Concepts: Historicism, Stream of Consciousness, War, Shell Shock	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	SHORT STORY: Sir Walter Scott - The Tapestry Chamber Kate Atkinson - Inner Balance Key Concepts: Gothic, Avant-Grade Movement, Interior Monologue, Word play	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	DRAMA: Ben Jonson - The Alchemist G.B. Shaw - Arms and the Man Key Concepts: Comedy of Manners, Atheism, Vegetarianism, Eugenics, Alphabet Reform	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	NOVEL: Julian Barnes - The Sense of an Ending Elizabeth Gaskell - North and South Key Concepts: Realism, Psychological Insight	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for End Semester Examination) Alfred George Gardiner - In Praise of Walking. Virginia Woolf - Mr. Bennett & Mrs. Brown Harold Pinter - The Birthday Party Arnold Wesker - The Merchant Rudyard Kipling - How the Camel got its Hump William Golding - Lord of the Flies David Mitchell - Black Swan Green	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

Newton, John and William Cowper. Olney Hymns: In Three Parts. Legare Street Press. 2022.

Woolf, Virginia. The Collected Essays of Virginia Woolf. Ingram Short Title, 2011.

Bacon, Francis. Of Essays. Penguin Classics.

Jonson, Ben. The Alchemist. Peacock Books. 2019.

Atkinson, Kate. Not the End of the World. Back Bay Books, 2004.

Shaw, George Bernard. Arms and the Man. Peacock Books, 2020.

Gaskell, Elizabeth. North and South, Penguin Publishers, 2012.

Barnes, Julian. The Sense of an Ending. RHUK, 2012.

Reference Books:.

Pinter, Harold. The Birthday Party. London: Eyre Methuen, 1986

Simon Dittrich. Virginia Woolf's Perspective on Fiction: An Examination of Virginia Woolf's Essays

Modern Fiction and Mr. Bennett and Mrs. Brown. Grin Verlag. 2009.

Wesker, Arnold. The Merchant. Methuen Drama. 2006.

Golding, Williams. Lord of the Flies. Faber & Faber. 1999.

Mitchell, David. Black Swan Green. Random House. 2006.

Web References

<https://www.poemhunter.com/poem/a-letter-to-my-aunt/>

<https://www.amnesty.ie/wp-content/uploads/2016/06/home-by-warsan-shire.pdf>

https://barcelonareview.com/32/e_ka.htm

<https://www.ipl.org/essay/A-Short-Story-A-Mother-Of-James-F382WJU74SJP6https://etc.usf.edu/lit2go/79/just-so-stories/1301/how-the-camel-got-his-hump/>

Pedagogy Seminar, Assignment, role play and group discussion.

Course Designer Dr. S. Senthilkumari

Signature of the Course Designer

Signature of the HOD

SEMESTER II	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PEN2CC6	TRANSLATION THEORY & PRACTICE	CORE COURSE- VI (CC)	6	5

Course Objectives:

- To understand theories of translation of various translators across the globe.
- To reinforce translation as an academic discipline of knowing various genres in different language.
- Master the technical art of applying linguistic knowledge with subject in qualitative standard.

Pre requisite:

- Gain vast knowledge of various class and literature of different cultures, valid texts in the wide world.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze translation with a profound knowledge of knowing Various literature across the globe and its difficulties	K1,K2, K3,K4
CO2	Compare and evaluate the theories and its applicability in Various genres.	K1,K2, K3,K4,K5
CO3	Determine the importance of Bible translation classics and texts to possess a wide knowledge of global literature for higher learning and research.	K1,K2, K3,K4, K5
CO4	Formulate texts based on Thirukural poems, Prose, Drama by bilingual mode of interpretation through practice and research.	K1,K2, K3,K4, K5,K6
CO5	Creatively imagine to translate passages with equivalent words for higher learning and better prospects	K1,K2, K3,K4, K5,K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	3	3
CO2	2	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	2	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Definition of Translation (Nida, Roman Jakobson, Susan Bassnet, Catford) – Types of Translation – Translation process – Principles-Equivalence. Key Concepts: Source Language, Target Language, Encoding, Decoding, Intra Lingual, Inter Lingual, Inter Semiotics.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Brief History of Translation – Bible Translation – Period Study –Theorists (Chapman, Wyatt, Surrey, Abraham Cowley, John Dryden, Alexander Pope, Goethe, Schlegel, H.W. Longfellow, Fitzgerald, Hilarie Belloc) Key Concepts: Period Study, Transition of Bible, Renaissance, Post Modernism	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Inter-linear, Intra-linear and Inter-semiotic, formal and Dynamic Equivalence. Linguistic, Paradigmatic, Syntagmatic and Stylistic Equivalence Key Concepts: Levels and Strategies of various theorists, Problems of equivalence, Cognitive insight into the Process of Translation	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Transliteration and Transcreation- Kinds of Untranslatability-Linguistic and Cultural factors - Translating literary text, Prose, Poetry, and Drama Key Concepts: Problems of Translators, Problems of Translation in the global world	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Girish Karnad - Hayavadana Translation Practice News Paper Reports அறிஞர் அண்ணா - செவ்வாழை பாரதியார் கவிதைகள் - அன்னை மீல் மூல அன்னை மீல் மூல Key Concepts : Biography, Human Values- Love, Compassion, Passage Translation, Character Sketch, Themes, Patriotic Songs of Bharathiyar.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for End Semester Examination) Translation of Film Pop Songs. Thirukkural – Possession of Decorum Translation practice in poem, various chapters in Thirukural and Paragraph Translation.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Bassnet, Sussan. *Translation Studies*. London: Routledge, 1991.
2. Bassnet, Sussan & Harish Trivedi. *Post-Colonial Translation – Theory and Practice*. London: Routledge, 1999.
3. Newmark, P. *Approaches to Translation*. Oxford. Pergaman Press, 1982.
4. Nida, E. *The Theory and Practice of Translation*. Leiden: E.J. Brill, 1969
5. Ramachandran. T.N. *Four Long Poems of Mahakavi Bharathi. Tanjavur: SainSekkizar School of Saiva Siddanta, 2009*

Reference Books:

1. Collins. *Cobuild Dictionary*. New Delhi: Orient Black swan, 2014.
2. Steiner, G. *After Babel: Aspects of Language and Translation*. Oxford: University Press, 1978.

Web References

<https://www.exoticindiaart.com/book/details/four-long-poems-of-mahakavi-bharati-tamil-text-translation-in-english-notes-and-index-naw494/>
<https://dheivegam.com/achamillai-achamillai-bharathiyar-kavithai/>
https://www.valaitamil.com/sevvazhai_1591.html
<https://www.google.com/search?q=thirukural+translation&ei=RJYRY9-zHLuNseMPu72I0A0&ved=0ahUKEwjf5ZjZsfX5AhW7RmwGHbseAtoQ4dUDCA4&uact=5&q=thirukural+translation> https://kupdf.net/download/hayavadana-girish-karnadpdf_5b7a3cd3e2b6f5e162fe7c3d_pdf

Pedagogy: Seminar, Assignment,

Course Designer: Ms. A. Edel Flora Mary

Signature of the Course Designer

Signature of the HOD

SEMESTER II	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS /WEEK	CREDITS
23PEN2CC7	AMERICAN LITERATURE	CORE COURSE -VII (CC)	6	5

Course Objectives:

- To have an awareness on social, cultural and political issues in American Literature.
- To analyze literary works within the contexts of different literary periods.
- Understanding of the contribution of different texts and authors to American literary tradition.

Pre requisite:

- An understanding of History of American writers of and their writings.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Examine to comprehend and analyze historical movements in dramatic literature, life and dreams of America as reflected in the literary works for higher learning and social outlook	K1,K2, K3,K4
CO2	Determine the issues, conflicts and themes of the various genres in contemporary poems of society and the world	K1,K2, K3,K4,K5
CO3	Evaluate and explore how literary drama reflects and shapes the perceptions of critical social issues for Higher learning and research.	K1,K2, K3,K4, K5
CO4	Construct the elements of literature such as themes, motifs, style and tone, for critical thinking.	K1,K2, K3, K4, K5,K6
CO5	Formulate critical research problems in the literary text and also analyze, evaluate and synthesis them to interpret and gain knowledge for higher learning and better prospects.	K1,K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	3	3
CO2	3	3	3	2	2	3	3	3	2	3
CO3	3	3	3	3	2	3	3	3	2	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	POETRY Walt Whitman - I Sit and Look Out Emily Dickinson - I Died for Beauty - but was Scarce Maya Angelou - Phenomenal Women Key Concepts: Jealousy, Bitterness, Solitude, Unrequited, antecedent, bizarre, contradiction, recurring, wench, protrude, phenomenal, stunning	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	PROSE William Bradford - The May Flower Compact Marilynne Robinson - The Givenness of Things. Key Concepts: Embark, Endeavors, Trope, Intuition, Oppressed, Bourgeois, Civilization, Glory, Honour, Covenant.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	SHORT STORIES Henry James - The Real Thing Edger Allen Poe - Fall of the House of Usher Key Concepts: Impoverished, Complicated, Imagination, Indisputably, Controversial, Proletarian, Religious, Communist, Implication, Mortality, Blemish, Concoctions,	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	DRAMA David Mamet - A Life in the Theatre. Ralph Ellison - Invisible Man Key Concepts: Industrialization, Technological, Identity, Expressionism, Realism, Abandonment, Discrimination, Confront, Civil War.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	FICTION John Steinbeck - Of Mice and Men James Baldwin - Go Tell it on the Mountain Key Concepts: Migrant, Loneliness, Isolation, Depression, Disintegration, Alienated, Fictitious, Satirical, Racial, Identity, Isolated	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for external examination.) Ann Bradstreet - To my Dear and Loving husband Gloria Naylor - The Women of Brewster Place Edward Albee - Who is Afraid of Virginia Wolf.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. The New Anthology of American Poetry Vol1. Edited by Steven Gould Axelrod, Camille Roman, Thomas Travisano, Rutgers University Press, 2012.
2. The New Anthology of American Prose Edited by Steven Gould Axelrod, Camille Roman, Thomas Travisano 2000.
3. Home, Springer, link.springer.com
4. Robinson, Marilynne. The Givenness of Things, Virago, 2015.
5. Ellison, Ralph. Invisible Man, Penguin Classics, 2001.
6. Poe, Allan Edgar. Fall of The House of Usher, Prabhat Prakashan, 2016.
7. Baldwin, James. Go Tell it on the Mountain, Penguin, 2001.
8. Naylor, Gloria. The Women of Brewster Place, Penguin USA, 2000.

Reference Books:

1. Kenneth Sacks: Understanding Emerson: The *American Scholar* and his struggle for self-Reliance Princeton, New Jersey: Princeton University Press, 2003. Second.
2. Oliver, Egbert S. American Literature. 1890-1965 An Anthology. 1994.
3. William, J Fisher, et. al, 19th Century: An Anthology. Eurasia Publ. House. Pvt. Ltd., New Delhi. 1984.

Web References

<https://en.wikipedia.org/wiki/AmericanLiterature>
<https://americanliterature.com>
www.poetryfoundation.org/.
<https://www.britannica.com/topic/A-Life-in-the-Theatre>
<https://allpoetry.com/I-Sit-And-Look-Out>
<https://themayflowersociety.org/history/the-mayflower-compact/>
<https://www.gutenberg.org/files/2715/27>
<https://www.hackensackschools.org/site/handlers/filedownload.ashx?moduleinstanceid=607&dataid=5293&FileName=the%20piano%20lesson%20-%20august%20wilson.pdf>
<https://www.scoilnet.ie/go-to-post-primary/english/mice/#:~:text=Of%20Mice%20and%20Men%20is, strive%20for%20a%20better%20life.>

Pedagogy : Group Discussion, Seminars, Quiz and Assignments.

Course Designer : Ms. Irudhaya Pushpam .M

Signature of the Course Designer

Signature of the HOD

SEMESTER II	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PEN2CCC1A	LITERARY THEORY AND CRITICISM	CORE CHOICE COURSE – I (CCC)	6	4

Course Objectives:

- To acquaint the students with literary criticism down the ages.
- To demonstrate the key concepts in Literary Criticism
- To think critically about the different critical approaches.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyse the overall outline to literary criticism from various perspectives.	K1,K2, K3,K4
CO2	Evaluate the importance of literary theories with the text to create holistic thinking.	K1,K2, K3,K4,K5
CO3	Determine literary criticism with literary characters and works for professional growth and for higher learning.	K1,K2, K3,K4, K5
CO4	Formulate the core points in literary theories for critical thinking and creativity.	K1,K2, K3, K4, K5,K6
CO5	Discuss literary theory with literary themes to gain knowledge for higher learning and professional development.	K1,K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	2	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	2	3
CO5	3	3	3	3	2	3	2	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	NEW CRITICISM: Cleanth Brooks – The Language of Paradox MARXISM Louis Althusser – Infrastructure and Superstructure, The State Ideological Apparatuses (Ideology and Ideological State Apparatuses) PRACTICE POEM: Robert Frost - The Road Not Taken Key Concepts: Close reading, autotelic, base, superstructure	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	STRUCTURALISM: Ferdinand de Saussure – Nature of the Linguistic Sign (Course in General Linguistics, Part one, pg no. 65 - 70) POST STRUCTURALISM: John Hillis Miller - The Critic as Host PRACTICE POEM: John Milton - On His Blindness Key Concepts: Sign, Binary Oppositions, Birth of reader	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	PSYCHOANALYTICAL CRITICISM Sigmund Freud - Creative Writers and Day-dreaming” POSTMODERNISM Jean Francois Lyotard -Defining the Postmodern PRACTICE POEM : Emily Dickinson - A Narrow Fellow in the Grass Key Concepts: Unconscious, Interpretive Communities	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	GENDER STUDIES Simone De Beauvoir – The Second Sex ECOCRITICISM William Rueckert – Literature and Ecology: An Experiment in Ecocriticism PRACTICE POEM: Kamala Das - The Looking Glass Key Concepts: Radical Feminism, Phallogentric, Ecology	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	POST-COLONIAL STUDIES Chinua Achebe -An Image of Africa: Racism in Conrad’s Heart of Darkness READER RESPONSE CRITICISM: Stanley Fish – Is there a Text in this Class? PRACTICE POEM: Derek Walcott - A Far Cry from Africa Key Concepts: Racism, Identity, Meta narratives	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF -STUDY FOR ENRICHMENT (Not to be Included for External Examination.) Elements and Traits of New Criticism, Marxism, Structuralism, Post Structuralism, Psychoanalytical Criticism, Reader Response Criticism, Gender Studies, Ecocriticism, Post-Colonial Studies, Postmodernism, Queer Theory, Transgender Theory	--	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Saussure, Ferdinand De. *Course in General Linguistics*. The Philosophical Library, Inc., 1959.
2. Richter, David H. *Falling into Theory*. Bedford/St. Martin's, 1999.
3. Scott, Wilbur. *Five Approaches of Literary Criticism*. Macmillan, 1963.

Reference Books:

1. Barry, Peter. *Beginning Theory. An Introduction to Literary and Cultural Theory*. Manchester University Press, 2009.
2. Culler, Jonathan. *Literary Theory*. OUP, 2011.
3. Leitch, Vincent B. *The Norton Anthology of Theory and Criticism*. OUP, 2001.

Web References

https://www.sas.upenn.edu/~cavitch/pdf-library/WimsattBeardsley_Intentional.pdf
<http://www.csun.edu/~snk1966/Lous%20Althusser%20Ideology%20and%20Ideological%20State%20Apparatuses.pdf>
[Barthes-The-Death-of-the-Author.pdf \(tufts.edu\)](#)
[The Laugh of the Medusa \(csudh.edu\)](#)
<https://static1.squarespace.com/static/5441df7ee4b02f59465d2869/t/58f2e526bf629a9dbf74f778/1492313394594/RUECKERT++Literature+and+Ecology.pdf>
<http://ponderosaenglishkessler.weebly.com/uploads/9/5/1/5/9515361/achebe-chinua.pdf>
<http://thowe.pbworks.com/f/lyotard.defining.postmodern.PDF>

Pedagogy : Seminar, Group discussion and Assignment,

Course Designer : Ms. P.K. Durgadevi

Signature of the Course Designer

Signature of the HOD

SEMESTER II	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PEN2CCC1B	COMMONWEALTH LITERATURE	CORE CHOICE COURSE-I (CCC)	6	4

Course Objectives:

- To introduce learners to literary theory from the beginning of the twentieth century till now
- To help learners apply theory in the analysis of literary texts present day
- To enable learners to understand a wide range of theoretical perspectives to enhance their appreciation of literary texts

Pre requisite:

- Thorough knowledge in literary theories and its application to the text.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Examine the literary premises of intellectual and social background pertinent to important eras of the literary and critical theory	K1, K2, K3, K4
CO2	Determine the terms used in the criticism of literature for holistic thinking.	K1, K2, K3, K4, K5
CO3	Evaluate to Historicize and contextualize foundational theoretical and critical texts for professional growth and for higher learning.	K1, K2, K3, K4, K5
CO4	Formulate possible applications of critical theory to various literary texts to train them as professionals	K1, K2, K3, K4, K5, K6
CO5	Imagine students to discover their own interests in literary and critical theories creatively for higher learning and better prospects.	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	3	3	3	2
CO2	3	2	3	3	3	3	3	3	3	2
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	3	3	3	3	3	3	2	3	3
CO5	2	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	POETRY E. J. Pratt - The Dying Eagle Mariam Waddington - The Drug Addict David Diop - The Vultures Kenneth Slessor - Gulliver A. D. Hope - Australia Key concepts: Literariness and Paraphrasing is heresy, Free play, equality	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	PROSE Margaret Atwood - Nature as a Monster from Chapter 2 of Survival: A Thematic Guide to Canadian Literature C.D Narasimhaiah - Commonwealth Literature: Heirloom of Multiple Heritage Key concepts: Literature and Environment, Gender Oppression, race	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	SHORTSTORIES Katherine Mansfield - Miss Brill Chinua Achebe - Dead Men's Path Key concepts: Base and Superstructure, Orient, Negritude, Dasein, Anxiety, Despair.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	DRAMA Wole Soyinka - The Road Manjula Padmanabhan - The Harvest Key concepts: Gynocritics, Feminine, Feminist, Literature and Environment	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	FICTION Michael Ondaatje - The English Patient Shashi Tharoor - The Great Indian Novel Key concepts: Disillusionment, Break from Tradition, Self Referentiality, Objective Truth	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF -STUDY FOR ENRICHMENT (Not to be included for external examination.) Samuel Selvon – The Lonely Londoners Margaret Atwood – Surfacing	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Narasimhaiah, C.D. *Commonwealth Literature: History and Criticism*, AnuragJain,1995.
2. Soyinka, Wole. *A Dance of the Forest*, Surjeet Publications, 2018.
3. Padmanaban, Manjula. *Harvest*, Aurora Metro Books, 2003.
4. Ondaatje, Michael. *The English Patient*, Vintage,1993.
5. Koetzee, J.M. *Disgrace*, Vintage, 2000.
6. Katherine Mansfield *Miss Brill* Penguin Classics
7. Tharoor, Shashi, *The Great Indian Novel*. Arcade Publishing,1993.

Reference Books:

1. Maity, Joydev. *Commonwealth Literature: A Comprehensive and Critical Perspective*, Notion Press,2020.

Web References

<https://www.scribd.com/document/443622445/The-Dying-Eagle>
https://canlit.ca/canlit_authors/miriam-waddington-2/
<https://www.australianculture.org/an-aboriginal-mothers-lament-charles-harpur-1853/>
<https://allpoetry.com/poem/8521575-Gulliver-by-Kenneth-Slessor>
<https://sahyadriliterature.blogspot.com/2018/08/poem-analysis-of-australia-by-a.html>
<https://warwick.ac.uk/fac/arts/english/currentstudents/postgraduate/masters/modules/resourcefiction/oil09/wiwamonthday.pdf>
<https://rufusonline.blogspot.com/2006/02/road-wole-soyinka-critical-summary.html>
https://www.sabanciuniv.edu/HaberlerDuyurular/Documents/F_Courses_/2012/Dead_Mens_Path.pdf
<https://unreadpoetsociety.com/2022/08/26/the-vultures-by-david-diop/>

Pedagogy : Lecture, Assignment , Seminar

Course Designer : Dr.V.Sudhandra Devi

Signature of the Course Designer

Signature of the HOD

SEMESTER II	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PEN2CCC1C	SKILL ENHANCEMENT	CORE CHOICE COURSE – I (CCC)	6	4

Course Objectives:

- Learn what a group is and how individuals interact in a group
- Know why interviews are held and what they are looking for
- Have a good understanding of what your own priorities are in a job
- Appreciate the importance of etiquette for a good living.
- Examine how work attitudes relate to job performance.

Pre requisite:

- To make the students able and efficient communicators by helping them to be self-reflexive about English, goal oriented and be fine-tuned for career opportunities.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze the text, and respond to basic comprehension questions for better critical thinking to face the challenges of the world.	K1, K2, K3, K4
CO2	Examine English grammar skills to enhance grammatical components in written and verbal communication to achieve their goal.	K1, K2, K3, K4
CO3	Interpret an idea in series logically connected sentences by describing an event such as objects, people, places, processes for conducting activities like group discussion, presentation, reporting and documentation in changing situations for growth and progression.	K1, K2, K3, K4, K5
CO4	Construct to comprehend the given passage and able to answer the linked questions for professionalism, higher learning and research.	K1, K2, K3, K4, K5.
CO5	Create interest to write creatively to enhance professionalism for holistic thinking for higher learning and better prospects.	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	2	3	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	2	3	2	2	2
CO4	2	2	3	3	3	3	2	3	3	3
CO5	2	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	GROUP DISCUSSION Leadership and problem-solving skills Critical Thinking Negotiation Skills Key Concepts: Group Dynamics, Team Building, Develops Leadership Quality.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	PURPOSE OF INTERVIEW Before and after the Interview Do's and Don'ts in an interview Time Management Framing & Answering Questions Key Concepts: Interview Techniques, Body Language.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	PREPARING A RESUME Writing a Cover Letter Steps in Preparing a Resume Template for Covering Letter Key Concepts: Placement Training, Writing Bio-data.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	PERSONALITY DEVELOPMENT Presentation Skills Public Speaking Stress Management Conflict Management Key Concepts: Creative Thinking, Debates	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	WORKPLACE ETIQUETTE Values and Ethics Gender equality Emotional Intelligence Documentation Key Concepts: Develops Human Values, Workplace Ethics, Equality of Status.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for External Examination.) Writing for the Digital Media Travel Writing Mock Interview Attitude Development	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. How to Succeed at Interviews Paperback – 1 January 2008 by Yeung, Dr.Rob (Author)
2. Cracking the Code to a Successful Interview Pellett, Evan .2016.

Reference Books:

1. Co, Lina Mukhopadhyay &. *Poly skills: A course in communication skills and life skills*. Chennai: Foundation, 2012. print.
2. Seema Gupta. Corrected Manners and Etiquette, www.vspublishers.com

Web References

www.udemy.com
<https://www.coursera.com/>
www.edx.org
www.udacity.com

Pedagogy: Quiz, Assignment, Seminar

Course Designer : Dr.V.Sudhandra Devi

Signature of the Course Designer

Signature of the HOD

SEMESTER II	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS /WEEK	CREDITS
23PEN2DSE2A	ENGLISH LANGUAGE TEACHING	DISCIPLINE SPECIFIC ELECTIVECOURSE – II (DSE)	6	3

Course Objectives:

- To know the insights of ELT in LSRW skills and Grammar
- To be aware of the old and modern methods and approaches in ELT
- To effectively choose and apply the appropriate method in a classroom during ELT

Pre requisite:

- To attain knowledge of English and focus on the holistic development.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze the concepts of language between the theories of second language acquisition in life situations.	K1, K2, K3, K4
CO2	Determine a positive attitude towards language learning through different methods across the world.	K1, K2, K3, K4, K5
CO3	Assess the language learning strategies effectively through aptitude, objective and descriptive types of tests for professional growth.	K1, K2, K3, K4, K5
CO4	Formulate the ability to consider the students' needs, language development levels, ages, intelligence types and learning styles For critical thinking and research.	K1, K2, K3,K4, K5, K6
CO5	Construct to create English Language Learning with Technologies and create an awareness of social and environmental issues for higher learning.	K1, K2, K3,K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	2	3
CO2	3	3	3	2	2	3	3	3	2	3
CO3	2	3	3	3	3	2	3	3	2	3
CO4	2	2	2	3	3	2	2	3	3	3
CO5	3	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	HISTORY OF ELT IN INDIA/ STATUS AND IMPORTANCE OF ENGLISH LANGUAGE Principles, Aims and Objectives of Teaching English Place of English in Curriculum & Grammar in ELT Key Concepts: Theories of Language- Growth of English Language	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
II	METHODS OF TEACHING Problems Involved in ELT Communicative Method, Natural Approach, Total Physical Response, Suggestopedia. Key Concepts: Task Based Approach, Lexical Approach, Eclectic Method, Post Method.	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6
III	DESIGNING A SYLLABUS & CURRICULUM Criteria for selection of Teaching Materials, Assumptions underlying materials in ELT ICT Tools, Teaching Aids Key Concepts: Avoid Grammatical Errors, Motivational Approach and Communicational Approach.	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6
IV	TEACHING OF DIFFERENT SKILLS (LSRW) Teaching of Pronunciation, Grammar, Vocabulary, Integrated skills, study skills, Skimming, Scanning. Key Concepts: Types of Learning- Activity based Learning.	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6
V	EVALUATION & ASSESSMENT Nature and Scope of Evaluation, Types of Tests and its Characteristics. Different aspects of teaching various components of Language. Key Concepts: Creative Teaching Methodologies –Online Teaching and Learning	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5,K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for external examination.) ICT Methodologies Applied Linguistics – History of English Education. Oral Approach and Situational Approach	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6

Text Books:

1. Rogers & Richards. *Approaches, Methods and Techniques*. Cambridge, 2014.
2. Krishnaswamy, N and Lalitha Krishnaswamy. *Methods of Teaching English*.
3. Nagaraj, Geetha. *English Language Teaching*. New Delhi: Orient Black Swan, 2008.
4. Peter, Francis. *A Glossary of ELT Terms and Key Concepts*. *English Language Teaching*. Chennai. Shrine Print Solution, 2012. Print
5. Wood.T. Frederick, *An Outline History of The English Language*. (2nd edition). Chennai: Macmillan India Limited, 1969.Print.

Reference Books:

1. Cook.V. *Second Language Learning and Language Teaching*, Oxford University Press,2008.
2. Ellis,R. *Understanding SLA*, Oxford University Press,1986.
3. Littlewood, W.*CLT: An Introduction*, Cambridge University Press 1981.
4. Prabhu, N.S.*SL Pedagogy*, Oxford University Press,1987
5. Aggarwal, J.C. *Principles, Methods and Techniques of Teaching*. New Delhi: Vikas Publishing House, 2009.
6. David Crystals. *Linguistics* (pages 239-243, 9-36) I.F. Wall work. *Language and Linguistics*, London: Longman House, 1995. Print.
7. Mark Arff and Janie Rees – Miller ed. *The Handbook of Linguistics*, USA: Blackwell Publishers,2001.
8. Thornbury Scott, *An A-Z of ELT: A Dictionary of Terms and Concepts*. Underhill Adrian (Ed.) Macmillan Books for Teachers, 2006, Print.
9. Kumaravadivelu. B, *Understanding Language Teaching*, Lawrence Erlbaum Associates, Publishers, London,2006.

Web References

https://edu.google.com/intl/ALL_in/workspace-for-education/classroom/
<https://www.sli.do/>
<https://padlet.com/>
<https://kahoot.com/>

Pedagogy: Seminar, Assignment

Course Designer: Ms. Diana Betty Garrett

Signature of the Course Designer

Signature of the HOD

SEMESTER II	INTERNAL MARKS:25 EXTERNAL MARKS:75			
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS /WEEK	CREDITS
23PEN2DSE2B	POST-COLONIAL STUDIES	DISCIPLINE SPECIFIC ELECTIVE COURSE – II (DSE)	6	3

Course Objectives:

- To re-assess colonial histories and Post-colonial Literatures in all their complexity and diversity.
- To promote awareness regarding post-colonial issues.
- To present a positive attitude towards complexity and diversity of post-colonial literature.

Pre requisite:

- To have an awareness of various cultures and studies of post in Colonial Literature.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze and relate the concepts of post-colonial literature in social cultural background.	K1,K2, K3,K4
CO2	Determine a positive attitude towards complexity and diversity of post-colonial literature to create a better literary world.	K1, K2, K3, K4,K5
CO3	Assess the various themes and motif of post-colonial literature for a professional outlook.	K1, K2, K3, K4, K5
CO4	Compare the various themes, characters, style and technique in post-colonial literature for research and higher learning.	K1, K2, K3,K4, K5,K6
CO5	Discuss the various issues focused in post-colonial literature for holistic thinking.	K1, K2,K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	2	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	3	2	3	2	3	3	3
CO5	2	3	3	3	3	2	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	INTRODUCTION Birth, Evolution and growth of Post- Colonial Literature, Post-Colonial Terms, Theories and Post-Colonial Studies. Key Concepts: Ambivalence, Hybridity, Hegemony	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6
II	POETRY Derek Walcott – A Far Cry from Africa Gabriel Okara – The Mystic Drum Emily Davis – A Song of Winter Key Concepts: Diaspora, Ideology, Features of Poetic Devices	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6
III	PROSE Bill Ashcroft, Gareth Griffiths & Helen Tiffin – The Empire Writes Back (Post-coloniality and Theory) Arundhati Roy – The End of Imagination Key Concepts: Social Inequality, Integration, National Identity	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5. K6
IV	SHORT STORIES Khushwant Singh – Karma Nadine Gordimer – Six Feet of the Country Key Concepts: Sustainability, Social Discrimination.	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
V	DRAMA Wole Soyinka – Death and the King’s Horseman Key Concepts: Salvation, Aboriginal Culture, Individuality	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3,K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for End Semester Examination) Homi Bhabha - Nation and Narration Frantz Fanon – Black Skin, White Mask Chinua Achebe – Anthills of The Savannah https://www.google.com/search?q=oxford+union+speech+by+shashi+tharoor&oq=oxford+union+speech&aqs=chrome.10i512l2j69i57j0i22j30l7.6881j0j7&sourceid=chrome&ie=UTF-8	--	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6

Text Books:

1. Ashcroft. *Key concepts in Post-Colonial Studies*, Routledge Publishers 1998.
2. Donnell Margaret Joan *Anthology of Commonwealth Verse*, Blackie & Son (January 1,1963)
3. Walsh William. *Readings in Commonwealth Literature*, Oxford University Press 1973.

Reference Books:

1. Pramod K Nayar. *Post-Colonial Literature: An Introduction*, Pearson Education India 2008.
2. Childs Peter. *Post-Colonial Theory and English Literature: A Reader*, Edinburgh University Press 1999.
3. Ashcroft, *Key Concepts in Post-Colonial Studies*

Web References

<https://poets.org/poem/far-cry-africa>
<https://www.lyrikline.org/en/poems/woman-man-1239>
<https://www.spokesmanbooks.com/Spokesman/PDF/68roy.pdf>
<https://elibrary.tucl.edu.np/bitstream/123456789/9975/2/chapter%281%29.pdf>
<http://asherxai.blogspot.com/2010/03/karma-short-story-by-khushwant-singh.html>
<https://www.newyorker.com/magazine/2009/05/18/in-the-south>
<https://xpressenglish.com/our-stories/six-feet-of-the-country>

Pedagogy : Quiz, Assignment, Seminar

Course Designer : Ms.L.Samyuktha

Signature of the Course Designer

Signature of the HOD

SEMESTER II	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PEN2DSE2C	BRANCHES OF LINGUISTICS	DISCIPLINE SPECIFIC ELECTIVE COURSE – II (DSE)	6	3

Course Objectives:

- To understand the structure and branches of linguistics
- To build an insight towards the composition of language in a methodical manner.
- To gain focus on Linguistics and its development in Language and Literature.

Pre requisite:

- Basic knowledge on the sound, meaning, syntax, structure, and development of language.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze the roots and history of language thereby increasing the Study of the spoken medium and of the processes of language interaction.	K1, K2, K3, K4
CO2	Examine the recent developments in language evolution over many generations connecting it with the variation and change from Multiple perspectives.	K1, K2 K3, K4
CO3	Assess and derive insights of language changes noticed in The contemporary world and to assist in language research and for higher learning.	K1, K2, K3, K4, K5
CO4	Develop language function and cognitive systems, the relationship between language and society, the new ways of examining how the brain responds to language.	K1, K2, K3, K4, K5, K6
CO5	Estimate the language of individuals as acquired knowledge that is the product of their encounter with external social, co-operative endeavor.	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	2	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	WHAT IS LINGUISTICS? A short history of linguistics, Introduction to Phonetics, Phonology, Semantics, The Interaction of linguistics with other disciplines Key Concepts: Human Language, General Characteristics of Language, Languages Through Time, Articulation, Speech Perception, Phonemics and Phonetics, Semantics in Descriptive and Typological Linguistics, Semantics and Pragmatics.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	SOCIOLINGUISTICS Inter- Speaker Variation & Intra- Speaker Variation- Multilingual Communities, Socio Pragmatics, Indian Stylistics. Key Concepts: Language Variation and Change, Methodology, Ethnography, variables, Sampling the speech Community, Gender, Race, Ethnicity, Age, Social Class, Social Networks and Communities of Practice.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	PSYCHOLINGUISTICS The First Wave, The Second and Third Wave. Key Concepts: Language Acquisition, Cognitive Revolution, Experimental Psycholinguistics, The Rise of The Machines	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	COMPUTATIONAL LINGUISTICS Sentiment Analysis, Statistical models Key Concepts: Natural language processing, Machine Learning - N-gram language models, Part-of speech tagging, Distributional semantics, Computational Grammars	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	COGNITIVE LINGUISTICS Philosophical stance, Constructions, Embodiment Key Concepts: Rejection of Modularity and The Autonomy of Language, Rejection of The Autonomy of Syntax Hypothesis, Motivation, Acquisition, Background Cognition	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for End Semester Examination) Novels for the Analysis of the above Linguistics George Orwell -1984 David Mitchell -Cloud Atlas	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Allan, Keith, Editor. *The Routledge Handbook of Linguistics*. Routledge, 2016.
2. Thakur, Vijay Singh. *Stylistics of Indian English Fiction*. ISBN- 10-8183871763, Jan 1 2008.

Reference Books:

1. Malmkjaer, Kirsten, Editor. *The Routledge Linguistics Encyclopedia*. Third edition, Routledge, 2010.

Web References

<https://leverageedu.com/blog/branches-of-linguistics/>
<https://www.careers360.com/articles/branches-of-inguistics-counar>
<https://blog.cambridgecoaching.com/what-is-linguistics-intro-to-branches-of-linguistics> <https://linguistics.ucsc.edu/about/what-is-linguistics.html>
<https://all-about-linguistics.group.shef.ac.uk/branches-of-linguistics/>

Pedagogy: Chalk and Talk, PPT, Quiz, Group Discussion, Seminar, Assignment

Course Designer: Dr.R.Shanthi

Signature of the Course Designer

Signature of the HOD

CAUVERY COLLEGE FOR WOMEN, (AUTONOMOUS)

NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC

ISO 9001:2015 CERTIFIED TIRUCHIRAPPALLI

PG DEPARTMENT OF ENGLISH



M.A ENGLISH

SYLLABUS

SEMESTER IV

2022-2023 AND ONWARDS

**CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS,
PG DEPARTMENT OF ENGLISH**

VISION

- The Department of English envisions the learners to explore and empower LSRW skills thereby gaining competency in various genres of literature across the world.
- Ensuring the aesthetic sensibility and creativity of the learners for higher pursuits in research and professional career.

MISSION

- Procure academic excellence by mastering language and literature, imbibe human values embedded with personality enrichment.
- To gratify the needs of employability and enshrine learners as socially responsible citizens.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	STATEMENTS
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR MA ENGLISH

PO. No	On completion of MA English, the students will be able to
PO1	Exhibit comprehensive knowledge in understanding the issues and problems that arise in the society and apply in life circumstances. (Social Responsibility)
PO2	Achieve in-depth knowledge in various genres of literary texts to contribute the best for the society and to create a better world. (Exploring Success)
PO3	Perceive leadership skills through higher learning and be a visionary to achieve the target. (Professional Competence)
PO4	Identify appropriate resources required for research projects to explore novel ideas to gain real life experience through internships and higher studies. (Discover Innovations)
PO5	Create a scientific attitude and aptitude to undertake research studies for higher learning and career opportunities. (Build Scientific Temperament)

PROGRAMME SPECIFIC OUTCOMES FOR MA ENGLISH

PSO No.	Students of MA English will be able to	POs Addressed
PSO 1	Evaluate literature through politics, environment, society, values, gender and sociological perspectives in reality	PO1
PSO 2	Analyze cognizance to classify the perspectives of English Language and Literature, genres and literary styles of various literatures across the world.	PO1 PO2
PSO 3	Examine writers and their literary works through literary devices and theoretical approaches for professional growth.	PO3
PSO 4	Explore deep insights of literature through hands on experience in research studies enriching critical thinking and creativity.	PO4 PO5
PSO 5	Empower language, linguistics and literature for professional development, crack competitive examinations and to build employability skills.	PO5



Cauvery College for Women (Autonomous), Trichy-18
PG Department of English
M.A Programme Structure
(For the Candidates admitted from the Academic year 2022-2023 onwards)

I Semester

Semester	Course	Course Title	Course Code	Inst.	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course – I (CC)	British Literature -I (1340-1798)	22PEN1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Shakespeare	22PEN1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Indian English Literature	22PEN1CC3	6	5	3	25	75	100
	Core Course - IV (CC)	Black Women’s Writing in English Literature	22PEN1CC4	6	5	3	25	75	100
	Discipline Specific Elective Course-I (DSE)	A. Rhetoric & Stylistics	22PEN1DSE1A	6	3	3	25	75	100
		B. European Fiction in Translation	22PEN1DSE1B						
		C. Technical English	22PEN1DSE1C						
	Total			30	23				500

15 Days INTERNSHIP during Semester Holidays

II Semester

Semester	Course	Course Title	Course Code	Inst.	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ex t.	
II	Core Course– V (CC)	British Literature – II (1799-Present Age)	22PEN2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Translation Theory & Practice	22PEN2CC6	6	5	3	25	75	100
	Core Course – VII(CC)	American Literature	22PEN2CC7	6	5	3	25	75	100
	Core Choice Course– I (CCC)	A. Literary Theory and Criticism	22PEN2CCC1A	6	4	3	25	75	100
		B. Commonwealth Literature	22PEN2CCC1B						
		C. Skill Enhancement	22PEN2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A. English Language Teaching	22PEN2DSE2A	6	3	3	25	75	100
		B. Post-Colonial Studies	22PEN2DSE2B						
		C. Branches of Linguistics	22PEN2DSE2C						
	Internship		22PEN2INT		02				100
	Extra Credit Course	SWAYAM		As per UGC Recommendation					
	Total			30	24				600



Cauvery College for Women (Autonomous), Trichy-18

PG Department of English

M.A., Programme Structure

(For the Candidates admitted from the Academic year 2022-2023 onwards)

III Semester

Semester	Course	Course Title	Course Code	Inst.	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
III	Core Course– VIII (CC)	Asian Literature in English	22PEN3CC8	6	5	3	25	75	100
	Core Course – IX (CC)	Research Methodology	22PEN3CC9	6	5	3	25	75	100
	Core Course - X (CC)	Cultural Studies	22PEN3CC10	5	5	3	25	75	100
	Core Choice Course- II (CCC)	A. Cyber Security	22PGCS3CCC2A	5	4	3	25	75	100
		B. Post Modern Fiction	22PEN3CCC2B						
		C. Australian Literature	22PEN3CCC2C						
	Discipline Specific Elective Course-III (DSE)	A. English Literature for UGC Examinations	22PEN3DSE3A	5	3	2	-	100	100
		B. Single Author Study – Rabindranath Tagore	22PEN3DSE3B			3	25	75	
		C. Global Fiction	22PEN3DSE3C						
	Generic Elective Course -I (GEC)	The Great Indian Epic literature - A Philosophical Approach	22PEN3GEC1	3	2	3	25	75	100
Credit Extra Course	SWAYAM		As per UGC Recommendation						
Total			30	24				600	

IV Semester

Semester	Course	Course Title	Course Code	Inst.	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
IV	Core Course– XI (CC)	North East Indian Literature	22PEN4CC11	6	5	3	25	75	100
	Core Course - XII (CC)	Nobel Laureates 1913-2022	22PEN4CC12	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. New Literature	22PEN4CCC3A	6	4	3	25	75	100
		B. Climatic Literature	22PEN4CCC3B						
		C. Dalit Literature	22PEN4CCC3C						
	Generic Elective Course - II (GEC)	Campus to Global Connect	22PEN4GEC2	3	2	3	25	75	100
	Project		22PEN4PW	9	5				100
Total			30	21				500	
	Grand Total			120	92				2200

Sl. No	Course	No. of Courses	No of Credits	Marks
1.	Core Course – (CC)	12	60	1200
2.	Core Choice Course – (CCC)	3	12	300
3.	Discipline Specific Elective - (DSE)	3	09	300
4.	Generic Elective Course - (GEC)	2	04	200
5.	Project	1	05	100
6.	Internship	1	02	100
Total		22	92	2200

SEMESTER IV



Cauvery College for Women (Autonomous), Trichy-18

PG Department of English

M.A., Programme Structure

(For the Candidates admitted from the Academic year 2022-2023 onwards)

IV Semester

Semester	Course	Course Title	Course Code	Inst.	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
IV	Core Course– XI (CC)	North East Indian Literature	22PEN4CC11	6	5	3	25	75	100
	Core Course - XII (CC)	Nobel Laureates 1913-2022	22PEN4CC12	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. New Literature	22PEN4CCC3A	6	4	3	25	75	100
		B. Climatic Literature	22PEN4CCC3B						
		C. Dalit Literature	22PEN4CCC3C						
	Generic Elective Course - II (GEC)	Campus to Global Connect	22PEN4GEC2	3	2	3	25	75	100
	Project		22PEN4PW	9	5				100
Total			30	21				500	
Grand Total			120	92				2200	

Signature		
Name & Designation	Dr. P.Urmila PG Head	Dr. N. Savithri Dean of Arts

SEMESTER IV	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS /WEEK	CREDITS
22PEN4CC11	NORTH EAST INDIAN LITERATURE	CORE COURSE-XI (CC)	6	5

Course Objectives:

- To introduce and intimate the learners about North East Indian Literature.
- To familiarize the learners with the various traditions of North East India.
- To expose and represent the contemporary trans-cultural issues.

Pre requisite:

- Basic knowledge of North East Indian Culture.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze the aesthetic experience of North East Indian Literature.	K1, K2, K3, K4
CO2	Examine the wide spectrum of social, political, cultural, and aspirational concern	K1, K2, K3, K4
CO3	Assess the factors which influence and contribute in literary production especially the women writers for higher learning and research.	K1, K2, K3, K4, K5
CO4	Evaluate the inappropriate notion of homogeneity mirrored in the Indian Literature is the practice of Tokenism.	K1, K2, K3, K4, K5, K6
CO5	Estimate the rich cultural and ethnolinguistic diversities of North East Indian Literature.	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	2	3	2	3	2	2	3
CO2	3	3	2	2	3	3	3	2	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	2	3	2	2	3	2	3	2	2	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	POETRY: Robin Ngangom - Native Land Esther Syiem - Suburban Friends Mono Zote - An Impression of being alive Nini Lungalang - Going Home Nitoo Das - The Cat's Daughters Key Concepts: Ethnic Conflicts, Militant Nationalism, Raising Eco-consciousness, Spatial tension between landscape and Mindscape, Homelessness.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	FOLK TALES: A Singpho Tribe Tale A Garo folktale - Kari (Salt) Tale of Mishmi Girl The Leap of Ka Likai. Man, Spirit and Tiger The Beginning of the Storytelling Tradition (selection from 8 Fascinating Myth and Legends from North East India) Key Concepts: Conservation of Nature and Ethnic Identity	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	SHORT STORIES: Tensula Ao - Laburnum for my Head Janice Pariat - 19/87 (from <i>Boats on Land</i>) Jahnavi Barua. - The Magic Spell (From Next Door) Anjum Hasan - Revolutions (From Difficult Pleasures) Key Concepts: Gamut of Emotions, Civil Unrest, Social- Cultural Experiences and Voicing for Marginals, Urban Melancholy.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	DRAMA: Binodini - Crimson Rainclouds Key Concepts: Exotic Indian Art	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	FICTION: Mamang Dai - The Legends of Pensam Jahnavi Barua - Rebirth Key Concepts: Preservation of tribal lore's and traditional beliefs	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for External Examination) Folk Tales from North East India - River Dolphin and Crocodile, The Egotistical Elephant and Praying Pebet, When the Earth was formed to its Present Shape Mitra Phukan - The Collector's Wife Teresa Rehman - The Mothers of Manipur	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Pariyat, Janice. "19/87". Boats on Land: A Collection of Short Stories. Random House India, 2012.
2. Barua, Jahnavi. "The Magic Spell". Next Door: Stories. Penguin Books India, 2008.
3. Hasan, Anjum. "Revolutions". Difficult Pleasures. Penguin UK, 2012.
4. Barua, Jahnavi. Rebirth: A Novel. Penguin Books India, 2010.
5. Binodini, Crimson Rainclouds. Thema, 2012.

Reference Books:

1. *Dancing Earth, An Anthology of poetry from North East India*. Ed. Robin singh Ngangom and Kynpham Singh Nongkynrih. India: Penguin Book, 2009.
2. Ao, Temsula. *Laburnum for my Head*. India: Penguin Book, 2009.
3. Pariat, Janice. *Boats on Land*. India: Random House, 2012.
4. Dai, Mamang. *The Legends of Pensam*. India: Penguin Book, 2008.
5. Nini. *The Morning Years*. Penthrill Publication House, 1994.

Web References

<https://www.uncannymagazine.com/article/the-cats-daughters/>

<https://theculturetrip.com/asia/india/articles/8-fascinating-myths-and-legends-from-northeast-india/>

<https://thenortheasttravelblog.com/2013/01/17/folklore-from-north-east-india-tale-of-a-mishmi-girl/#:~:text=Idu%20Mishmi%20man%20and%20woman,no%20hair%20in%20the%20body>

https://www.poetryinternational.com/en/poets-poems/poems/poem/103-13505_AN-IMPRESSION-OF-BEING-ALIVE

<https://www.lallmanvlog.xyz/2023/04/going-home-by-nini-lungalang.html?m=1>

Pedagogy Quiz, Assignment, Activity, PowerPoint Presentation

Course Designer S. Ramalakshmi

Signature of the Course Designer

Signature of the HOD

SEMESTER IV	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PEN4CC12	NOBEL LAUREATES 1913 - 2022	CORE COURSE – XII(CC)	6	5

Course Objectives:

- To identify the elements and the key components of Award-Winning work of art in English Literature.
- To familiarize the students with the characteristics of various literary genres.
- To understand literature as an expression of human values within a historical and social context.

Pre requisite:

- Basic Knowledge in English Literature.

C Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze the different techniques employed by the prominent Writers.	K1, K2, K3, K4
CO2	Evaluate the concepts of various Genres.	K1, K2, K3, K4, K5
CO3	Determine the various the dramas in English Literature and also diagnose the literary awards for higher learning	K1, K2, K3, K4, K5
CO4	Formulate the way the writers tried to create an impact and contribute through writings.	K1, K2, K3, K4, K5, K6
CO5	Discuss the characters in the works of Award-Winning writers.	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	3	3	2	3	3	3	3
CO2	3	3	2	2	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	POETRY (DETAILED) T. S. Eliot - The Hippopotamus Pablo Neruda - Cat's Dream Key Concepts: Alliteration, Simile	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
II	PROSE (DETAILED) George Bernard Shaw -The Sources of Idealism Albert Camus - The Minotaur or The Stop in Oran Key Concepts: Idealism, Corruption, Humanity	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
III	SHORT STORIES (DETAILED) Rabindranath Tagore – Subha Pearl S. Buck - The Refugee Key Concepts: Feminism, Tradition, Culture and Literature	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
IV	DRAMA (DETAILED) Susan Glaspell – Alison's House Key Concepts: Literary Devices, World War-I	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
V	FICTION (DETAILED) Dorris Lessing - The Golden Notebook Key Concepts: Elements of a Novel, Historical Fiction	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for External Examination) Read the poems of Award-Winning Authors Anthologies of Rabindranath Tagore	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6

Text Books:

1. Tagore, Rabindranath. The Postmaster Selected Stories, New Delhi: Penguin Books Limited.2000
2. Lessing, Dorris. The Golden Notebook, London, Harper Collins Publisher.2007.

Reference Books:

1. Buck, Pearl S, A Cultural Biography, Cambridge University Press.1998.
2. Tagore, Rabindranath, An Anthology, St. Martin's Publishing Group.1999.

Web References

https://www.poetry-archive.com/e/the_hippopotamus.html <https://allpoetry.com/Cat%27s-Dream>
<http://www.blupete.com/Literature/Essays/Best/ShawIdealism.html>
<https://thejqcorner.wordpress.com/2020/05/06/the-minotaur-or-the-stop-in-oran-by-albert-camus/>
<https://archive.org/details/alisonshouseplay00glas/page/n1/mode/2up>
http://gcwk.ac.in/econtent_portal/ec/admin/contents/68_R18ELC102_2020121702043043.pdf

Pedagogy : Seminar, Assignment

Course Designer : Ms. Diana Betty Garrett

Signature of the Course Designer

Signature of the HOD

SEMESTER IV	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PEN4CCC3A	NEW LITERATURE	CORE CHOICE COURSE – III (CCC)	6	4

Course Objectives:

- To engage the students in comparative and interdisciplinary thinking.
- To create an awareness and understanding of the common and different values, ideals and insights often expressed in works of literature from different cultures and historical periods.

Pre requisite:

- Basic knowledge of selected literary texts, concepts, and terminology to develop substantial reading

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyse the text intensively and distinguish its salient features	K1, K2, K3, K4
CO2	Examine the unique style of writers in expressing their culture around the world	K1, K2, K3, K4
CO3	Assess the literary works at various levels of comprehension for higher learning	K1, K2, K3, K4, K5
CO4	Develop the research-oriented analysis, and criticism of literary and cultural texts from different genre.	K1, K2, K3, K4, K5, K6
CO5	Estimate and create a critical knowledge multiple cultural and linguistic traditions, and various historical periods	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	2	3	3	3	3	2	3
CO3	3	3	3	2	3	3	3	3	2	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	POETRY Rahmat Shah Sayel - Kabul and Peshawar are the closest of friends (Afghanistan) Robert William Service - A Mediocre man (Canada) Oodgeroo Noonuccal - We are going (Australia) Anne Kennedy - Flood Monologue (New Zealand) Key Concepts: Plight of Pashtoon After Partition, Identity, Destructiveness of Colonialism, Environmental Issues	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	PROSE Aung San Su Kyi - Freedom from Fear (Myanmar) Key Concepts: Identity, Freedom, Military Domination	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	SHORT STORIES Chimamanda Ngozi Adichie - A Private Experience (Africa) Akhlaq Ansari- The Mirror (Pakistan) Key Concepts: Riot in Kona, Separation, Ethnic and Religious Conflict, Culture,	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	DRAMA Zeami Motokiyo Hogoromo – The Feather Mantle (Japanese) Key Concepts: The Power of Sea, Fate and Mortality	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	FICTION Dolki Min -Walking Practice (South Korean) Anuk Arudpragasam - A Passage to North (Sri Lanka) Key Concepts: Mother Daughter Relationship, Separation, Old Age, Longing, Loss and Legacy of War	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for End Semester Examination) John Shaw Nelson - To a Blue flower (Poetry) Khin Yhin Yu - Love (Short Story)	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. O'Sullivan.V (Ed), *An Anthology of Twentieth Century New Zealand Poetry*, Wellington,1979.
2. Shin, Kyung-sook, *Please Look After Mom*, translated by Chi-Young Kim, Changbi Publisher,2011.
3. *Selected Myanmar Short Stories* Translated by Ma Thnaegi, Unity Publishing House, 2016.
4. Arudpragasam, Anuk. *A passage to North*, Hogarth Press, 2021.

Reference Books:

1. Neilson, John Shaw, *Collected Poems of John Shaw Neilson*, Ed. R.H. Croll, Melbourne, 1934.
2. Achebe, Chinua, *Things Fall Apart*, William Heinemann, 1958.

Web References

<https://www.poetrytranslation.org/poems/kabul-and-peshawar-are-the-closest-of-friends> <https://canpoetry.library.utoronto.ca/yanofsky/poem5.htm>
http://famouspoetsandpoems.com/poets/oodgeroo_noonuccal/poems/4601
<http://cordite.org.au/chapbooks-features/6seater/flood-monologue/>
<http://jti.lib.virginia.edu/japanese/noh/PouHago.html>

Pedagogy Seminar, Quiz, Assignment

Course Designer Ms. VANMATHI. SIVA

Signature of the Course Designer

Signature of the HOD

SEMESTER:IV	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PEN4CCC3B	CLIMATIC LITERATURE	CORE CHOICE COURSE – III (CCC)	6	4

Course Objectives:

- To introduce climate literature as a tool to understand eco-literature
- To emphasize impact of climate change on emotional and psychological grounds
- To represent possible ways to handle and recondition the climatic changes

Pre requisite:

- A comprehensive familiarity with the eco-literature and eco-criticism
- A thorough understanding about the relationship between ecology and human lives

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyzing and Comparing Climatic literature and Eco-literature. Describing the distinctive features of Climate literature	K1, K2, K3, K4
CO2	Examine and illustrate the voice raised against the hazards caused by the climate change	K1, K2, K3, K4
CO3	Assess the texts in the ecological perspective to bring out greater engagement with climatic change in the literary studies.	K1, K2, K3, K4, K5
CO4	Evaluate the multi ethnic movement by creating strong connection between environment and issues of social justice	K1, K2, K3, K4, K5
CO5	Develop a constructive knowledge about the impact of global crisis on art and literature	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	2	3	3	3	3	2	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	INTRODUCTION Helen E. Mudler - What is climate change literature, and why is it important? Key Concepts: Influence of Climate change in Literature, difference between eco-literature and Climate change literature	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	POETRY Agha Shahid Ali - Postcard from Kashmir Surbhi - In the Whirlwind of Destruction Linda Hogan - Song for the turtle in the gulf Key Concepts: Environment changes, Melting Glaciers, Air Pollution, Endangered Ocean Lives.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	SHORT STORY Craig DeLancy - Racing the Tide Key Concepts: Water Pollution, Impact of Water Pollution on Human Lives.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	DRAMA Charles L. Mee - Global Warming Key Concepts: Effects of Temperature on Earth's Atmosphere, Water Pollution, Marine Pollution, Harms of Ingest Toxins.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	FICTION Emmi Itaranta - Memory of Water John Grisham - Gray Mountaion Key Concepts: Geographical Changes, Politics, Fresh Water Scarcity, Destruction of Exotic Landscapes	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for External Examinations) Metallic Reefs - Sam Illingworth (Poem) Seed - Iliana Vargas (tr. Michelle Mirabella) (Short Story) The butterfly effect -Rajat Chaudhuri (Fiction) The Turquoise Elephant - Stephen Carleton Introducing the Anthropocene : The Human Epoch (Article belongs to 50th Anniversary Collection.)	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Rowson, Jonathan. 9 Original poems on climate change, RSA, 2015
2. Spahr, Juliana. “Unnamed Dragonfly Species” wills, 2011
3. Grisham, John. Gray Mountain, Hooder & Stoughton General Division, 2008.
4. Itaranta, Emmi. Memory of Water, HarperCollins, 2014.

Reference Books:

1. Bacigalupi, Paolo. The Windup Girl. Night Shade Books, 2009.
2. Martin, Mark. I’m with the Bears, Verso books, 2011.
3. Oreskes, Naomi and Erik Conway, The Collapse of Western Civilization: A View from the Future. Columbia, 2014.
4. Rich, Nathaniel. Odds against Tomorrow. Farrar, Straus and Giroux, 2013.

Web References

<https://www.poetrynook.com/poem/postcard-kashmir>
<https://www.familyfriendpoems.com/poem/in-the-whirlwind-of-destruction>
<https://www.charlesmee.org/global-warming.shtml>
<https://poets.org/poem/song-turtles-gulf>

Pedagogy Assignment, seminar, and role play

Course Designer Ms. VANMATHI. SIVA

Signature of the Course Designer

Signature of the HOD

SEMESTER IV	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECTCODE	COURSE TITLE	CATEGORY	HRS /WEEK	CREDITS
22PEN4CCC3C	DALIT LITERATURE	CORE CHOICE COURSE – III (CCC)	6	4

Course Objectives:

- To explain the significance of Dalit Literature as a lofty image of grief.
- To critically understand sorrows, tribulations, slavery degradation, ridicule and poverty endured by Dalits.
- To evaluate an overview of the nuanced perspectives discerned in Dalit Literature.

Pre requisite:

- Explore how Dalit community struggled for equality and liberty.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze and understand Dalit literature from an Aesthetic perspective.	K1, K2, K3, K4
CO2	Examine and evaluate Self- Reflexivity about Dalit literature.	K1, K2, K3, K4
CO3	Assess the evolution of consciousness about caste-based discrimination for higher learning and research.	K1, K2, K3, K4, K5
CO4	Estimate and illustrate the major issues faced by the Dalit people.	K1, K2, K3, K4, K5
CO5	Develop a sensitive and compassionate approach towards Dalit life experiences and issues for better prospects.	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	S	3	3	3	3
CO2	3	3	3	2	3	2	3	3	3	3
CO3	3	2	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	INTRODUCTION Dalit literature - Past, Present and Future Dalit Discourse and Aesthetics Key Concepts: Religious and Political Discrimination, Liberation	18	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5,K6
II	POETRY Arun Kamble – Which Language should I Speak L.S.Rokade – To be or not to be Born Keshav Meshram – In our Colony Key Concepts: Racial and Cultural Inequality, Caste Oppression	18	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5,K6
III	PROSE B.R.Ambedkar – Annihilation of Caste Sections I-VI. Key Concepts: Tribulations, Degradation	18	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5,K6
IV	SHORT STORIES Ajay Navaria - New Custom C. Ayyappan - Spectral Speech Key Concepts: Humiliation, Humanitarianism	18	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5,K6
V	FICTION Omprakash Valmiki - Joothan P.Sivakami - The Grip of the Change Key Concepts: Religious Discrimination, Marginalization, Alienation	18	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5,K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for End Semester Examination) Manohar Mouli Biswas - I shall go to war Kumar - Black Ink Chander - Thappu Bama - Karukku	--	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5,K6

Text Books:

1. Kumar Raj Dalit Personal Narratives, Orient Black swan Private Limited – New Delhi; 1st edition (1 January 2011)
2. Dasan M.,Pratibha V.et al (ed).2012. the oxford India anthology of Malayalam Dalit Writing. New Delhi: Oxford University Press.2012
3. B.R.Ambedkar Annihilation of Caste POD Only Publishing (1 January 2020)
4. Remembering Omprakash Valmiki by Translated from the Hindi by Arun Prabha Mukherjee, 5. Bhatkal & Sen; Third Reprint Edition (1 December 2007)
5. Sivakami. P The Grip of Change Orient Longman (4 March 2006)
6. Poisoned Bread: Translations From Modern Marathi Dalit Literature by Arjun Dangle.

Reference Books:

1. Ajay Navaria, ‘New Custom’, trans. Laura Brueck, in The Exercise of Freedom: An Introduction to Dalit Studies, eds K. Sathyanarayana, Susie Tharu (New Delhi: Narayana Publishing, 2013).
2. C. Ayyappan, ‘Spectral Speech’, trans. V. C. Harris, Indian Literature 183, Feb, 1998
3. Rajkumar, ‘Dalit Literature and Criticism’, Orient Blackswan, 15 January, 2019.

Web References

<http://shodh.inflibnet.ac.in:8080/jspui/bitstream/123456789/1197/2/02%20introduction.pdf>
<http://marathidalitpoetry.blogspot.com/2014/07/to-be-or-not-to-be-born/sroka.html>
https://ccnmtl.columbia.edu/projects/mmt/ambedkar/web/readings/aoc_print_2004.pdf
<https://gallatin.nyu.edu/utilities/events/2011/10/strangehomeliness.html>
<https://www.boloji.com/articles/13246/omprakash-valmiki-joothan>
<https://www.arcjournals.org/pdfs/ijsell/v2-i11/2.pdf>
<http://marathidalitpoetry.blogspot.com/2014/07/which-language-should-i-speak-arun.html>

Pedagogy : Quiz, Seminar, Assignment.

Course Designer : Ms.L.Samyuktha

Signature of the Course Designer

Signature of the HOD

SEMESTER IV	INTERNAL MARKS:25		EXTERNAL MARKS:75	
SUBJECT CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PEN4GEC2	CAMPUS TO GLOBAL CONNECT	GENERIC ELECTIVE COURSE – II (GEC)	3	2

Course Objectives:

- To provide students with the Good professional skills which helps to build and maintain positive relationships
- To improve student's effectiveness, suitability and relative advantages along with the latest developments in science and technology globally.

Pre requisite:

- Basic knowledge in oral communication, written communication and computational skills.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	To develop a positive and productive Knowledge from verbal, written communication to digital communication	K1, K2, K3, K4
CO2	Assess the communication, interpersonal, team work, organizational and digital skills	K1, K2, K3, K4
CO3	Examine the language effectively and efficiently to achieve the goals and objectives of the communicator	K1, K2, K3, K4, K5
CO4	Estimate the knowledge, ideas, thoughts and messages between individuals or groups within or between organizations.	K1, K2, K3, K4, K5, K6
CO5	Assess to build and maintain relationships, facilitate decision-making and promote understanding globally	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	3	3	2	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	COMMUNICATION SKILLS Verbal and Non-Verbal Communication Visual and Written Communication Cross-Cultural Communication Body language and Emotional Intelligence Key Concepts: Active Listening, Cultural Context Logical Thinking.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	INTERPERSONAL SKILLS Presenting and Explaining Narrating and Demonstrating Arguing, Requesting and demanding Persuading Key Concepts: Deliverance, Requisition, Persuasion.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	TEAM WORK SKILLS Collaborating and Problem-Solving Critical Thinking and Adaptive thinking Intercultural Competence and Citizenship Leadership skills Key Concepts: Brain storming, Conflict Resolution, Decision Making.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	ORGANISATIONAL SKILLS Maintaining Records Arranging and Participating Meetings Event Management Networking abilities Key Concepts: Physical Organization, Organizational techniques, Categorization, Maintenance	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	DIGITAL LITERACY Working with Data, Tables, Charts and Graphs Making Presentation Content Creation VideoConferencing Key Concepts: Digital Media Platforms, Technical Assessment.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF-STUDY FOR ENRICHMENT (Not to be included for End Semester Examination) Basic Technical Knowledge Creativity Resilience Work Ethics Research Skills	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Parkman, Larry. Communication Skills Training. Fighting Dreamers Productions. 2020.
2. Sorin, Dumitrascu. Interpersonal Communication Skills for Business: A Practical Guide. 2016.
3. Rees, W. David & Christine Porter. Skills of Management and Leadership: Managing People in Organizations. Palgrave Macmillan. 2015.
4. Dr.K. Mohana Sundaram. Developing the Life Skills in Digital Era. Krishna Publication House. 2020.

Reference Books:.

1. Lewrick , Michael, Patrick Link & Larry Leifer. The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems. Wiley. 2018.
2. Sarah Colantonio & Kedren Crosby. Authentic Communication. Lulu. 2021.

Web References

<https://www.hzu.edu.in/uploads/2020/9/Interpersonal%20Skills%20at%20Work.pdf>
https://www.nios.ac.in/media/documents/330srsec/online_course_material_330/Theory/Lesson_0
<https://nataliatodorova.webs.com/lecture%203.pdf>
<https://www.shine.com/blog/cognitive-skills>
<https://www.edubloxtutor.com/cognitive-skills>
<https://www.coursera.org/articles/what-are-technical-skills>

Pedagogy Seminar, Assignment, Role Play and Group Discussion.

Course Designer Ms. L. Samyuktha & Dr. S. Senthilkumari

Signature of the Course Designer

Signature of the HOD

ANNEXURE D



Cauvery College for Women (Autonomous), Trichy-18
PG & Research Department of Social Work
BACHELOR OF SOCIAL WORK
 (For the Candidates admitted from the Academic year 2023-2024 and onwards)

SEMESTER -I

Semest	Part	Course	Course Title	Course Code	Inst. Hrs.	Credits	Exam			Total
							Hrs	Marks		
								Int	Ext	
I	I	Language Course-I (LC)	Pothu Tamil-I	23ULT1	6	3	3	25	75	100
			Hindi ka Samanya Gyan aur Nibandh	23ULH1						
			Poetry, Grammar and History of Sanskrit Literature	23ULS1						
			Foundation Course: Paper I- French-I	23ULF1						
	II	English Language Course-I(ELC)	General English-1	23UE1	6	3	3	25	75	100
	III	Core Course – I(CC)	Introduction to Social Work	23USW1CC1	6	5	3	25	75	100
		Core Practicum - I (CP)	Field Work -I (P)	23USW1CC1P	6	5	3	40	60	100
		First Allied Course- I (AC)	Sociology for Social Work	23USW1AC1	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	Value Education	23UGVE	2	2	-	100	-	100
	Total				30	21				600

SEMESTER-II

II	I	Language Course-II (LC)	Pothu Tamil-II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar-II	22ULH2						
			Prose, Grammar and History of Sanskrit Literature	23ULS2						
			Basic French-II	22ULF2						
	II	English Language Course- II(ELC)	General English-II	22UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Communication in Social Work Practice	23USW2CC2	5	5	3	25	75	100
		Core Course III (CC)	Methods of Social Work	22USW2CC3	6	5	3	25	75	100
		First Allied Course – II (AC)	Basics of Economics and Political System	23USW2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
	Extra Credit Course		SWAYAM	As per UGC Recommendation						
Total					30	21				600

SEMESTER II	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT
23USW2CC3	COMMUNICATION IN SOCIAL WORK PRACTICE	CORE	5	3

Course Objectives:

1. To enable the students to understand the importance of Communication tools in dealing with social problems.
2. To study the different communication interventions in approaching the social problems.
3. To orient the students of how to use communication strategies in their social work practices.
4. To disseminate the advantages of communication tool among social workers.

Course Outcomes and Cognitive Level Mapping:

On the successful completion of the course, students will be able to:

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Define the concept and process of Communication, Interpersonal communication, Visual aids in communication, Communication planning and analysis in field	K1, K2
CO2	Identify the various tools used in different types of communication, communication planning and analysis	K3
CO3	Apply the Communication tools for Development	K4
CO4	Recommend the applications of Communication tools in social work practice among practitioners	K5
CO5	Elaborate and discuss the strategies used in different types of communications, communication campaign, advocacy and lobbying.	K6

Mapping of CO with PSO and PO

COs	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3	3	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Communication: Concept, Types – Verbal and Non-verbal communication, Visual and Written, Models, Process, Barriers and Importance of Communication, Key elements in the communication process.	15	CO1,CO2,CO3 CO4,CO5	K1,K2,K3,K4, K5,K6

II	Interpersonal Communication: Meaning, Types, Principles, Elements, Advantages of Interpersonal Communication	15	CO1,CO2,CO3 CO4,CO5	K1,K2,K3,K4, K5,K6
III	Visual Aids in Communication: Poster making, Notice boards, Flipcharts, Flash cards, Photographs, Pamphlets, Slide shows, Mass Communication-Television, exhibition, newspapers and magazines, advertisement, radio, film, VCD/DVD.	15	CO1,CO2,CO3 CO4,CO5	K1,K2,K3,K4, K5,K6
IV	Communication Planning and Analysis: Meaning & Concept Planning and Education and communication for national development.	15	CO1,CO2,CO3 CO4,CO5	K1,K2,K3,K4,K 5,K6
V	Communication as a tool for Social Workers: Importance of Communication in handling Social problems, Lobbying and Advocacy, Various online tools in dealing With Social Problems.	15	CO1,CO2,CO3 CO4,CO5	K1,K2,K3,K4, K5,K6
VI	Self-Study portions: (Not included for End semester examination) Communication strategies practiced in various settings- Community, Medical, Psychiatric, Family, Industrial etc.	-	CO1,CO2,CO 3,CO4,CO5	K1,K2,K3,K4, K5,K6

TEXTBOOK:

Singh, D. (2011). Communication & Interpersonal Skills for Social Work, *Indian Books & Periodicals*

REFERENCES:

- o D'Souza, Y. K (1999). *Communication Today and Tomorrow*, Discovery Publishing House, New Delhi.
- o Fullmer, D.W. and Bernard, H.W (1972). *Communication in Organizations*, Second Edition, Mumbai: Jaico Publishing House.
- o Koprowska, J. (2005). *Communication and Interpersonal Skills*, Learning Matters.
- o Lishman, J (2009). *Communication in Social Work*, Red Globe Press (2nd edition).
- o Mishra, R.K (2018). *Professional Communication Skills- An Approach towards bright career*, Satyam Law International.

ONLINE REFERENCES:

1. <https://www.skillsyouneed.com/ips/what-is-communication.html>
2. <https://www.simplilearn.com/what-is-interpersonal-communication-article>
3. <http://introtocommopen.source.ridgewater.edu/ModuleVIII/ModVIISect8.html>
4. <https://www.slideshare.net/MediaKitchen/communications-planning-what-it-is-a>
5. <https://study.com/academy/lesson/effective-communication-methods-in-a-social-workpractice.html#:~:text=Effective%20commu,ecisions%20and%20understand%20difficult%20information.>

Pedagogy: Lectures, Audios / Videos followed by discussion, Case Study presentations, PPT, Peer Learning and Student-led seminars

Course Designer: Dr. T. Amirtha Mary

SEMESTER I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
23USW2AC2	BASICS OF ECONOMICS AND POLITICAL SYSTEM	ALLIED	5	3

Course Objectives

- To introduce the concept of Economics and Economic Systems of Indian Society
- To understand the Indian Economic Policy with Globalization and political System

Prerequisites

The learner will understand the concept of Economics and Political System

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define, Recall, relate the concept of Economics & Political System of India	K1
CO2	Compare & Summar is the Indian Economic & Political Policy	K2
CO3	Identify, Analyse, organize for Economic &political Development in India	K3
CO4	Categories, Examine the systems of Economic & Political on Participation & Development	K4
CO5	Assess, explain & evaluate the solutions related to each of the economic & Political Issues	K5

Mapping of CO with PSO and PO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	1	3	3	1	3	2	1	1	1
CO2	1	2	1	2	1	2	3	1	1	2
CO3	3	1	1	2	1	3	3	3	1	3
CO4	1	1	2	3	2	3	2	2	1	1
CO5	3	1	2	1	1	1	2	2	2	1

“1”- Slight (Low) Correlation – “2” – Moderate (Medium) Correlation - “3” – Substantial(High)Correlation– “-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamental Concepts of Economics: Introduction to Economics, Definition, Importance and types of Economics Resources, Production, Consumption, Demand, Supply Redistribution of Wealth, Cost Efficiency and Scarcity. Principles of Economics.	15	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3,K4, K5
II	Economic System: Meaning, Types of economy and its differences. Definition, Features merits and demerits of Capitalism, Socialism, Mixed economy. Salient features of Public Sector and Private Sector.	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5
III	Concept of Economic Development: Definition, objectives, characteristics and impact of Liberalization, Privatization and Globalization. Gross Domestic Product, Roles and Functions–Reserve Bank of India (RBI), World Bank , International Monetary Fund.	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5
IV	Political System: Concept, Types, Elements, Concept of State, Democracy, Power, Government Authority, Liberty, Justice, Equality. Indian Constitution– The preamble, parts and schedule, Directive principles of state policy, Fundamental Rights & Fundamental Duties. Polity and Governance: The democratic ideology and process, Impact of polity on social system	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5

V	Political Parties and the Party System: Trends in the Party System in India. List of National and State parties, Roles and Functions of Political Parties, Political Participation– Merits & Demerits.	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self-Study for Enrichment (Not to be included for External Examination) Concept of Competition and market structures, consumers, demand, elasticity of demand, income distribution, market and prices, profits, price elasticity, Market economic and Mixed economics system, Sustainable development, Factors affecting economic growth, Advantages and disadvantages of representative democracy, Political Participation-definition, forms, types.	-	CO1, CO2, CO3, CO4, CO5, CO6	K1,K2,K3, K4,K5,K6

Textbooks

- Datt,G & Mahajan,A.(2016).Indian Economy,S., Chand Publishing.
- Agarwal,M.D & Joe,S (2010), Business Economics, Ramesh Book Depot, Jaipur, NewDelhi.
- Sathyanarayan,B.(2009).Essays on Economic Liberalization and Reforms, Anmol Publisher.
- Chandra,R.(2004).Globalization, Liberalization, Privatization and IndianPolity,GyanBooks;8edition.

References

- Karuppiah,S(2018).Indian Economy Key Concept, Kavin Mukhil Publications.
- Bhat,S.(2017).Privatization & Globalization Changing Legal Paradigm, Eastern Law House.
- Chandra,R.(2004).Globalization,Liberalization,Privatization and Indian Polity , Gyan Books; 8edition.
- Gupta,D.C.(1975).Indian Government and Politics, Vikas Publishing.
- Varma,S.P.(1975).Modern Economic Theory, Vikas Publishing.
- G. Austin, (2010) ‘The Constituent Assembly: Microcosm in Action’, in The Indian Constitution: Cornerstone of a Nation, New Delhi: Oxford University Press, 15th print, pp.1-25.

Web Resources

- <https://byjus.com/commerce/fundamentals-of-economics/>
- <https://corporatefinanceinstitute.com/resources/knowledge/economics/economic-system/>
- <https://open.lib.umn.edu/sociology/chapter/14-2-types-of-political-systems/>
- https://www.youtube.com/watch?v=TDs_jjv9Wbs
- <https://www.youtube.com/watch?v=n3lIaQzlbWo>
- <https://www.youtube.com/watch?v=kSQvYeTuxwM>

Pedagogy: Lectures, Audios/ Videos followed by discussion, PPT, Peer Learning and Student-led seminars

Course Designer : Dr. R.Anitha



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
PG & RESEARCH DEPARTMENT OF SOCIAL WORK
BACHELOR OF SOCIAL WORK
LEARNING OUTCOME BASED CURRICULUM FRAME WORK (CBCS-LOCF)
 (For the Candidates admitted from the Academic year 2022-2023 and onwards)

SEMESTER-IV

Semester	Part	Course	Course Title	Course Code	Ins.Hrs	Credits	Exam			Total
							Hrs	Marks		
								Int	Ext	
IV	I	Language Course - IV (LC)	Pandaya Ellakiyamum Urainadayum	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH2						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French-II	22ULF4						
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature – II	22UE4	6	3	3	25	75	100
	III	Core Course – V(CC)	Introduction to Social Work Research	22USW4CC5	5	5	3	25	75	100
		Core Course – VI(CC)	Social Welfare Administration	22USW4CC6	5	5	3	25	75	100
		Second Allied Course- II (AC)	Health Care Services	22USW4AC4	4	3	3	25	75	100
		Internship	Internship	22USW4INT	-	2	3	-	100	100
	IV	Generic Elective Course- II (GEC)	Women Rights and Laws	22USW4GEC2	2	2	3	25	75	100
			Basic Tamil-II	22ULC4BT2						
			Special Tamil- II	22ULC4ST2						
Skill Enhancement Course – I (SEC)		Life Skills(P)	22USW4SEC1P	2	2	3	40	60	100	
	Extra Credit Course	SWAYAM	As per UGC Recommendation							
	Total				30	25				800

SEMESTER IV	INTERNAL MARKS :25		EXTERNAL MARKS : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22USW4CC5	INTRODUCTION TO SOCIAL WORK RESEARCH	CORE	5	5

Course Objectives

- To understand the basic concepts of Research
- To deepen knowledge on all the components of data collection a data analysis in research.
- To impart knowledge on interpretation and use the information provided by research in an effective manner.
- To effectively communicate research solution in the form of report for future use.

Pre-requisites

The learners need to have a basic understanding on human growth and life stages.

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	COGNITIVE LEVEL
CO1	Define, Extend the Meaning of Research types and Research Design, Sampling and Data collection	K1, K2
CO2	Analyze, Evaluate and Explain the various methods of Sampling and Research and its scope.	K2,K4,K5
CO3	Identify and assess the statistical tools and its importance in data analysis.	K3, K5
CO4	Design Research report and Research Methodology	K6
CO5	Analyse and Elaborate the Methods, Tools of Data Collection and Data Processing	K4, K5

Mapping of CO with PSO and PO

Cos	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation – “2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation –

“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Introduction to Social Work Research Meaning and Definition of Research, Need and Relevance of Research, Ethical considerations in Research, Research: Need and scope of Social Work Research Approaches – Inductive and Deductive, Quantitative and Qualitative approaches, social research and Social Work	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Research Design: Meaning and Definition of Research design, Components and Types of Research Design-Exploratory, Descriptive and Experimental, social survey, Case study	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Sampling and Data Collection: Universe, Sampling: Meaning, Advantages and Disadvantages of Sampling, Sampling frame and unit, Types of Sampling: Probability and non-probability sampling	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Sources of data: Primary and Secondary Methods of Data Collection: Interviewing, Questionnaire, Observation and Focused Group Discussion. Tools for Data Collection: Interview schedule, Interview guide, Questionnaire, Pilot study, pre testing of tools. Data processing–Editing, Coding, Classification, tabulation.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Presentation of statistical data – Tabular and Graphic; Interpretation of statistical data, Writing Research Report – components; writing research abstract, bibliography and references, use of APA Format	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-study for Enrichment (Not to be included for End Semester Examinations) Learners can write a Research Proposal on Various Problems.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

TEXT BOOK

- C.R.Kothari .(2017) Research Methodology New Age International(P) Ltd Publishers

REFERENCES

- Griffith, A. (2007). *SPSS for Dummies*. New Delhi: Wiley India .
- Babbie Earl. (2007). *The Practice of Social Research*. Bilmont, USA: Thomson Ward worth.
- Saravanavel,P.(2015).*Research Methodology* .Kitab Mahal
- Arya,P.P.and YeshPal.(2011).*Research Methodology in Management (Theory and Case studies)*.Deep and Deep Publications

Web Sources:

- https://www.youtube.com/watch?v=LIAI_RRID3A
- <https://www.youtube.com/watch?v=IwJVnfw44SU>
- <https://www.youtube.com/watch?v=pTuj57uXWlk>

Pedagogy: Lectures, group discussion, PPT presentation, E content, Google class room and seminars.

Course Designer: Ms.S.Hema

SEMESTER IV	INTERNAL MARKS :25		EXTERNAL MARKS : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22USW4CC6	SOCIAL WELFARE ADMINISTRATION	CORE	5	5

Course Objectives

- To enlighten the students on concept and functions of social welfare administration
- To Know the various welfare programmes for uplifting weaker section of People
- To understand the Procedures for establishing Non-Governmental organisations
- To know the functions of Social Welfare Board at National and State level.

Pre-requisites

- The learners need to have a basic understanding Social Welfare Administration.

Course Outcomes and Cognitive Level Mapping

On successful completion of the course, the students will be able to

CO Number	CO Statement	COGNITIVE LEVEL
CO1	Define and explain the concept of Social Welfare Administration and its Process	K1, K2, K5
CO2	Develop and analyze the skills in Planning, Organizing , Coordinating, Reporting, Budgeting and Recording, Public Relations and Fund Raising	K3, K5
CO3	Examine and apply the knowledge on Welfare Programmes for weaker sections of people in the society	K3, K4
CO4	Justify and elaborate the procedures for establishing Non Governmental Organisations	K5, K6
CO5	Evaluate and examine the structure and functions of central and social welfare Boards and Classification of NGO's	K4, K5

Mapping of CO with PSO and PO

COs	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High)

Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Social Welfare Administration: Definition, Principles and scope, nature of social welfare administration. Role and functions of non-governmental organizations. Classifications of NGOs: Service providers, Empowerment NGOs, Support NGOs	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Basic Administration Processes: Planning, Organizing, Staffing, Decision-making, Coordination, Reporting and Budgeting (POSDCORB), Communication, Monitoring, Fund Raising, Evaluation, Public relations and Networking	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Welfare Programmes: Welfare Programmes for Women, Children, Youth, Aged, Destitute & Differently abled, Social Welfare Programmes for SCs & STs	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Social Welfare Organisations: Legislation Related to Registration of Societies and Trusts. Foreign Contribution and Regulation Act - 1976. Function and responsibilities of governing board, committees and office bearers in welfare organisations.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Social Welfare Administration in India: Organisational structure and Functions and Programmes of state and Central social welfare Boards.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	Self-Study for Enrichment (Not For Examinations): Understand the role and structure of any Old age homes, Orphan children and Disability homes	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

REFERENCES

- Mishra,D.D.(2015).Management of Development and Welfare Services.Mittal books India Pvt Ltd.
- Paul Choudhary,D.(1992). Social Welfare Administration. New Delhi: Atma Ram & Sons publications Pvt Ltd.
- Singh,M..K .(2015).Social Welfare Administration and Social Policy.Vayu Education of India Pvt Ltd.
- Goel,S.L.(2010).Social Welfare Administration . Deep & Deep Publications Pvt Ltd.
- Sachdeva,D.R .(2018). Social Welfare Administration in India.Kitab Mahal Publications Pvt Ltd

Web Resources

- <http://socialjustice.nic.in/SchemeList/index?mid=24541http://pmwelfareschemetn.in/en/schemes- for-youth>
- <https://www.yourarticlelibrary.com/women/women-welfare-programmes-in india/47647>
- <http://schemes-and-programmes-differently-abled-ministry-social-justice-and-empowerment&tbn>
- <https://www.youtube.com/watch?v=fb4B7M8NDck>

Pedagogy: Lectures, group discussion, PPT presentation, E content, Google class room and seminars.

Course Designer: Ms.S.Hema

Semester IV	INTERNAL MARKS:25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22USW4AC4	HEALTH CARE SERVICES	ALLIED	4	3

Course Objectives

- To introduce students to the basic concepts of health
- To make the students aware of health care services & Programmes.
- To interpret the learners on national health Programmes
- To teach the students on functions of national & International agencies on health

Pre-requisites

The learners need to have a basic understanding on health, diet, nutrition

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	COGNITIVE LEVEL
CO1	Define ,Recall ,determine , Dimensions of health ,hygiene & sanitation	K1, K2
CO2	Interpret , Explain the concept of Nutrition ,Malnutrition ,Balanced diet &nutritional deficiency disease	K3,K4
CO3	Understand ,Symptoms , complications treatment methods of Alternate system of health	K4
CO4	Examine the health care services, concept, Principles, Methods, Models of Health education.	K5
CO5	Analyse the functions & activities of national & international health agencies.	K6

Mapping of CO with PSO and PO

Cos	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	2	3	2
CO2	3	2	2	3	3	3	3	3	3	2
CO3	3	2	2	3	2	3	3	2	3	2
CO4	3	2	3	3	3	3	3	3	3	3
CO5	3	3	3	3	2	3	2	3	3	2

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Concept of health, definition, Dimension of health, Determinants and spectrum of health, Concept of Health care, Levels of health care, Elements of Primary Health Care, Principles of primary health care. Health care system, Role of social worker in community health.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6
II	Alternate Systems of Health Care -AYUSH (Ayurvedha, Yoga, Unani, Siddha, Homeopathy) – Definition, Etiology, Principles, Treatment Measures . Hygiene –Definition, Types Importance of Personal Hygiene. Sanitation – Definition, Meaning, Need and Importance Epidemiology- Definition, Objectives.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6
III	concepts of Nutrition and Balanced diet, Constitution of food, Nutritional Deficiency Disease, Malnutrition, Environment and Health- Components, Pollution, Recent Health issues.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Health Care services in India, Prevention, Promotion, Curative and rehabilitation aspect, Health Education: Definition , Contents ,Principles , Models of health education. Role of health care providers. Alma Ata Declaration	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Public Health administration, Components of Public Health Care, Public health programmes in India, Voluntary Health Agencies in India- Functions, International Health agencies, Special national level programmes for health, National Health policy 2017,	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6
VI	Self Study for Enrichment (Not For Examinations) Students are assigned to visit PHCs or Government Hospital to observe the facilities ,health services available & prepare for a presentation		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6

References:

- 1.Ahuja,N.(1998). Introduction to Psychiatry. Jaypee Brothers
- 2.Bajpai, P.K. (1998). Social Work Perspectives on Health. Rawat Publications, New Delhi.
- 3.Egan, Marcia. Kadushin, Goldie (2007). Social Work Practice in Community Based Health Care. The Haworth
- 4.Goel, S.L.,Kumar,R.(2007). Hospital Administration and Management- Theory and Practice. New Delhi: Deep &Deep Publications Pvt. Ltd.

5. Park, K. (2005). Preventive and Social Medicine. M/s Banarsidas Bhanot Publishers, Jabalpur (M1:Ch 4. Pp 85-98) Press, New York.
6. Sunder Lal Adarsh, Pankaj 2007 Textbook of community Medicine, CBS Publishers Tabish,
7. Hospital & Health Services Administration. New Delhi: Oxford University Press.

WebResources:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5144115/#> Healthcare in India – 2022 and beyond

[Primary health care \(who.int\)](#)

<https://www.youtube.com/watch?v=XozF9VBLEfU>

<https://www.youtube.com/watch?v=1LFp6ASW0Ao>

<https://www.youtube.com/watch?v=r9poHB-ldqk>

Pedagogy: Lectures, Group discussion, PPT, and seminars, e content, Google classroom and quiz

Course Designer: MS.PL.Rani

SEM- IV	EXTERNAL -100			
COURSE CODE	INTERNSHIP	CATEGORY	HOURS/WEEK	CREDITS
22USW4INT		Internship	-	2

Course Objectives

1. To develop positive attitude towards self and others.
2. To gain an in-depth understanding Goals, Objectives, Administration & Functioning in any of agency settings
3. To develop skills in observation, analytical learning, team work and recording
4. To utilize the knowledge on social work practices in social work settings

Prerequisites

To apply and to integrate classroom learning into practical field to perceive Professional practices of Social workers

COURSE OUTCOME

On the successful completion of this course, the students will able to

CO Number	CO Statement	KNOWLEDGE LEVEL
CO1	Recall,Demonstrate and Examine the practical application of Social work methods	K1,K2,K4
CO2	Identify the practices of various organisations	K3
CO3	Analyse the necessary skills and role of social workers in fields of Social work	K4
CO4	Assess the organization structure and sources of funds of various settings.	K5

Mapping of CO with PSO and PO

Cos	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation –“-” indicates there is no correlation

Guidelines for the Summer Internship

Summer internship gives an opportunity to develop linkage with reputed organizations.

The objectives of summer Internship is to expose students to the new learning situations and enable them to develop professional outlook and gain experience, which contribute for their professional development.

Summer Internship comprises a time frame of 15 days at the end of Third semester.

- The trainee must volunteer to locate a setting (own choice) about one month in advance and explore the possibilities of 15 days practice learning and need to submit a report under the guidance of faculty advisors.
- The field work setting should preferably have a professionally trained social worker on the team of a staff.

List of Organisations

- Anganwadi under ICDS- (Supplementary Nutrition, Non-formal Pre-school education, Nutrition, and Health education, Immunization, Health check-up)
- Industries- (Know about Organisation Structure, functions of Various departments application of Social Work Methods in industries)
- Schools- (Identifying the behavioural problems among school students and Intervention)
- Hospitals & Primary Health Centers- (Structure and functions of Medical Settings and Counsellors)
- NGO'S Working for Old age, Children, Transgenders and differently abled (Fund Raising, Organisation Structure and Functions)

The evaluation of the field work will be based on overall performance of the student in all the practicum requirements.

Method of Evaluation (External)

S.No	Components	Marks	Total Marks
I.VIVA VOCE (70 marks)			
1	Field attendance	10	100
2	Recording	20	
3	Objectives fulfilled	20	
4	Initiatives taken in the field	10	
5	Regularity and use of field work supervision	10	
II.	Agency evaluation	30	

Pedagogy: Field Visit, Report Writing, Observation and Case Study

Course Designer: Ms.S.Hema

SEMESTER IV	Internal Marks :25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22USW4GEC2	WOMEN RIGHTS AND LAWS	GENERAL ELECTIVE	2	2

Course Objectives

- To orient the students to on the constitutional provisions for women.
- To make the learners to understand the protective measures for women under general laws.
- To enable the learners to be aware of Women Specific Laws.
- To educate the learners to identify the protective laws for women.
- To make the students to know the women protective services.

Prerequisites

The Learner will understand the Rights of Women and Laws related to Women

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Define the concept of women rights and laws.	K1,K2
CO2	Identify women rights and apply appropriate women laws.	K3
CO3	Analyse national and international rights and protective measures for women	K4
CO4	Evaluate the agencies and services meant for protecting women.	K5
CO5	Elaborate the extent of enforcing laws meant for women	K6

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Women Rights: National and International - Rights of Women in Indian Constitution; The Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW)	6	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
II	Women Rights and General Laws: Marriage – Divorce – Maintenance – Guardianship – Adoption – Property Rights (only provisions for Women)	6	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

III	Women Specific Laws: Dowry Prohibition Act, 1961; The Maternity Benefit Act, 1961 (Amended in 1995); The Medical Termination of Pregnancy Act, 1971 (Salient features); Rape (Sec. 376 IPC)	6	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
IV	Women Protective Laws: The Protection of Women from Domestic Violence Act, 2005; The Indecent Representation (Prohibition) Act, 1986 ; The Immoral Traffic (Prevention) Amendment Act, 2006; Protection of Women from Sexual Harassment Act, 2013. (Salient features)	6	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
V	Protective Services for Women: All Women Police Stations – Legal Services – Free Legal Aid Services-Women Courts – Women Commission – Social Welfare Departments – Help Lines – Government Schemes.	6	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
VI	Self-study for Enrichment (Not to be included for End Semester Examinations) Learners need to make a literature survey of rights and laws for women in India and other countries. Case laws can be discussed on women issues.	-	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

Text Book:

Kaushik.P.D.(V). “Women Rights” Bookwell Publication

Reference Books

- o Aruna Goal. (2004). “Violence Protective Measures for Women Development and Empowerment” Deep and Deep Publications Pvt
- o Athilatchumai & Logamurthy.(2017). Law at your Hands. Suriyan Pathippagam. Chennai
- o ClairM.Renzetti, Jeffrey L.Edleson, Raquel Kennedy Bergen.(2001). Source Book on “Violence Against Women” Sage Publications
- o International Solidarity Network.(2006). “Knowing Our Rights” An imprint of Kali for Women
- o Jagatha.(2001). Women Protective Law. Sri Shenbaga Pathippagam, Chennai
- o Monica Chawla.(2006). “Gender Justice” Deep and Deep Publications Pvt Ltd.
- o Mythili Sivaraman.(1997). Women Rights Some Perspectives. Tamil Puthagalayam, Chennai.
- o Nitya Rao.(2008). “Good Women do not Inherit Land” Social Science Press and Orient
- o Blackswan Preeti Mishra.(2007). “Domestic Violence Against Women” Deep and Deep Publications Pvt Ramalingam T.(2000). Women Protective Laws. Vikatan Publications,Chennai
- o Rengammal R & Dr,Vausgi S.(2005). Feminist approaches and Use of Literature. Arivu Pathippagam, Chennai

Web References

https://nhrc.nic.in/sites/default/files/Women%E2%80%99s%20Rights%20in%20India%20complete_compressed.pdf
<https://wcd.nic.in/sites/default/files/wdvact.pdf>
<https://wcd.nic.in/sites/default/files/Sexual-Harassment-at-Workplace-Act.pdf>
<https://wcd.nic.in/sites/default/files/Draft%20THE%20TRAFFICKING%20IN%20PERSONS%20%28PREVENTION%20AND%20REHABILITATION%20%29%20BILL%20%202021.pdf>
https://www.mha.gov.in/sites/default/files/2022-09/WSBooklet_07032021%5B1%5D.pdf
https://www.youtube.com/watch?v=mnM5nec_mXU

Pedagogy: Lectures, Audios / Videos followed by discussion, PPT, and Student-led seminars.

Course Designer: Dr.G.Mettilda Buvaneswari

SEMESTER IV	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22USW4SEC1P	LIFE SKILLS (P)	SKILL ENHANCEMENT-I	2	2

Course Objectives

- To Introduce Students to the Concepts of Life Skills
- To Make the Students Familiar with Core Life Skills
- To Teach the Students on Application of Life Skills Through Day To Day Activities.

Pre-Requisites

The Learners need to have a Basic Understanding on skills

Course Outcomes and Cognitive Level Mapping

On The Successful Completion of The Course, The Students Will Be Able To

CO Number	CO Statement	COGNITIVE LEVEL
CO1	Define , Recall the Concept Of Life Skills& its Classification	K1, K2,
CO2	Interpret, Explain the Different Core Life Skills For Adolescents & Youth	K3,K4
CO3	Understand, Analyse & Application of Social Skills Through Activities	K1 &K5
CO4	Analyse and Application of Emotional Skills.	K4 &K5
CO5	Analyse The Functions & Activities of Thinking Skills	K4 &K5

Mapping Of CO With PSO And PO

Cos	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	2	3	2
CO2	3	2	2	3	3	3	3	3	3	2
CO3	3	2	2	3	2	3	3	2	3	2
CO4	3	2	3	3	3	3	3	3	3	3
CO5	3	3	3	3	2	3	2	3	3	2

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation –

“-” Indicates There Is No Correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Introduction To Life Skills: Definition, Need and Significance Classification Of Life Skills- Personal, Emotional& Social Skills	8	CO1, CO2, CO3, CO4, O5	K1, K2, K3, K4, K5
II	Life Skills For Adolescents And Youth, Effective Communication And Interpersonal Skills Self-Awareness And Empathy Application Of Life Skills In Day to-Day Life.	8	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Decision Making & Problem-Solving Skills Application of Life Skills In Day to-Day Life.	8	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Coping With Stress: Coping With Emotions, Application of Life Skills In Day to-Day Life.	8	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Critical Skills & Creative Skills, Application of Life Skills In Day To Day Activities	8	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Enrichment (Not For Examination) Learners Can Take Any Two Core Skills & Apply In A Real Situation & Present It	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

References:

- Adolescence And Life Skills. (2003).Commonwealth Youth Programm Asia Centre. Tata Mcgraw Hill.
- Darkar Framework For Action ,Education For All: Meeting Our Collective Commitments. (2000).Darkar, Senegal.
- Family Health International ,NACO,USAID.(2007).Life Skills Education Toolkit For Orphans And Vulnerable Children In India.
- Hilgard,E,Atkinson,R.C&Atkinson ,R,L.(1976).Introduction To Psychology(6th Ed).IBH Publishing Co., Pvt Ltd. New Delhi.
- Life Skills Resource Manual, Schools Total Health Program.(2006).Health Education And Promotion International Inc.,Chennai.
- Global Evaluation OfLife Skills Education Programmes Final Report, United Nations Children's Fund.(2012).New York.
- Kumar ,J, Keval.(2008).Mass Communication In India .Jaico Publication India Pvt.Ltd.
- Mangal,S,K.(2008).An Introduction To Psychology. Sterling Publishers Pvt. Ltd.New Delhi
- Morgan And King.(1993).Introduction To Psychology. Tata Mcgraw-Hill Publishing Company Ltd. New Delhi.
- Nair ,V, R.(2010).Life Skills Personality And Leadership. RGNIYD. Tamilnadu.
- Rao ,P.L.(2008).Enriching Human Capital Through Training And Development Excel Books. New Delhi.
- RGNIYD.(2008).Facilitators Manual On Enhancing Life Skills. Tamilnadu.
- Singh Madhu .(2003).Understanding Life Skills ,Background Paper Prepared For Education For All :The Leap To Equality.
- Stella Cottrell.(2008).The Study Skills Handbook. Palgrave Macmillan Ltd. (3rd Ed). New York.
- UNESCO And Indian National Commission ForCo-Operation With UNESCO. (2001).LifeSkills In Non –Formal Education: Review.
- Wallace ,R, Masters.(2001).Personal Development For Life And Work: UK. South Western.
- YUVA School Life Skills Programme: Handbook For Teachers .(2008).Department of Education and State Council Of Educational Research And Training. Vol I –IV. New Delhi.

You tube links:

<https://www.youtube.com/watch?v=6OdCoMgpx7o>

https://www.youtube.com/watch?v=_5Vbvjy1jAk

<https://www.youtube.com/watch?v=egiZXXtZZL0>

SKILL ENHANCEMENT COURSE (SEC) I :

Assessment Rubrics For 100 Marks

Internal :40 Marks

1.Participation In Activities – 20 Marks

2. Case Study Presentation -20 Marks

40 Marks

External: 60 Marks

1.Reporting & Documentation -20 Marks

2.Theoretical Knowledge -20 Marks

3.Communication and Presentation -10 Marks

4.Attitude &Commitment -10 Marks

60 marks

Pedagogy: Field Study, Individual Conference, Participation in Activities and Report Writing, Documentation

Course Designer: Ms.PL.Rani

SEMESTER-V

Semester	Part	Course	Course Title	Course Code	Ins.Hrs	Credits	Exam			
							Hrs	Marks		Total
								Int	Ext	
V	III	Core Course – VII(CC)	Family and Child Welfare	22USW5CC7	6	6	3	25	75	100
		Core Course – VIII(CC)	Community Development	22USW5CC8	5	5	3	25	75	100
		Core Course -IX(CC)	Introduction to Counselling and Guidance	22USW5CC9	5	5	3	25	75	100
		Core Practicum – III(CP)	Field Work Practicum(P)	22USW5CC3P	5	5	3	40	60	100
		Discipline Specific Elective – I (DSE)	A. Basics of Disaster Management	22USW5DSE1A	5	4	3	25	75	100
			B. Welfare of Vulnerable	22USW5DSE1B						
			C. Human Rights and Social Work	22USW5DSE1C						
	IV	Ability Enhancement Compulsory Course- IV(AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Social Entrepreneurship(P)	22USW5SEC2P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM	As per UGC Recommendation						
Total					30	29				700

SEMESTER V	Internal Marks :25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22USW5CC7	FAMILY AND CHILD WELFARE	CORE	6	6

Course Objectives

1. To equip the students to learn the basic concepts of methods of Social Work.
2. To make the learners to understand dealing with individuals, groups and communities.
3. To enable the learners to make use of the principles of methods of social work in appropriate situations.
4. To educate the learners to identify the differences among the various methods of social work
5. To train the learners in the application of the methods of Social Work

Pre-Requisites

The learners need to possess the basic knowledge about the family system and cultural practices existing in India.

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Define the concepts of Family and child welfare and explain issues and problems of families and children.	K1
CO2	Explain the problems of children and families.	K2
CO3	Identify factors contributing to problems of children and families.	K3
CO4	Evaluate the agencies working for family and child welfare	K4
CO5	Analyse Family and Child Welfare services in India	K5

Mapping of CO with PSO and PO

COs	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation – “2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation

– “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Family: Meaning and philosophy of Family; Types and functions of Families; changing patterns of family in Indian context; Family Organization, Disorganization and Disintegration: Meaning; Factors contributing to disintegration of families; Single Parent family: Definition, types, issues and challenges; Child-Parent Relationship: Issues and Remedies.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
II	Child: Definition; Children in need of Care and Protection: Child labourers, Street children, Trafficked children, Child-Beggars, Abused Children, Children living with HIV/AIDS; Problems of girl children. National Policy for Children in India.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
III	Family Welfare Services: National Family Welfare Programme; National Population Policy; National Rural Health Mission; Urban Family Welfare Schemes; Reproductive and Child Health Programme; Maternal and Child Health Services; Family welfare programmes; Methods of family planning: Artificial and Natural family planning methods; Role of social worker in promoting family welfare programmes.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
IV	Child welfare services: Concept and meaning of child welfare, Integrated Child Development Scheme; Pulse Polio Immunization Programme; Kasturba Gandhi Balika Vidyalaya; Mid-day Meal Scheme; New Parent Support Programme; Sarva Siksha Abhiyan, , Integrated Child Protection Scheme, Central Adoption Resource Authority, National Commission for Protection of Child Rights ; Legislative provisions for children in India (Salient features); Role of central and state government.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
V	Role of voluntary agencies in family and child welfare services: Institutional services:	18	CO1, CO2,	K1, K2, K3,

	Residential homes for children, Shelter homes, aftercare homes, homes for special children, SOS villages ; Non-Institutional services: Sponsorship, day/night care centres, foster care, adoption.; national and international organisations working for children.		CO3, CO4, CO5, CO6	K4, K5, K6
VI	Self-study for Enrichment (Not to be included for End Semester Examinations) Students need to visit PHCs, Anganwadi, Balwadi and get to know the functioning and write a report.	-	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

Text Book:

Reference Books

Ajit K. Singh.(2012). Family and Child Welfare . New Delhi :Centrum Press.

Devi, L. (1988). Encyclopedia of Child and Family Welfare. Institute for Sustainable Development, Lucknow :Anmol publication.

Ferguson.H. (2011). Child Protection Practice. London: Palgrave Macmillan.

Heredia, R.C. (1995). The Family in changing World. New Delhi: Indian Social Institute.

Khasgiwala, A. (1993). Family Dynamics: Social Work Perspective. Bangaluru, Anmol Publications.

Shireman, J. F. (2015). Critical Issues in Child Welfare. Columbia: University Press.

Rao, D.B. (1997). Care the Child. New Delhi: Discovery Publishing House.

Web References

Family and Child Welfare – Course, <http://ecoursesonline.iasri.res.in/course/view.php?id=198>

Child protection | UNICEF India. <https://www.unicef.org/india/what-we-do/child-protection>

MSWE-002 - eGyanKosh .<http://www.egyankosh.ac.in/bitstream/123456789/52017/1/Block-4.pdf>

<https://egyankosh.ac.in/bitstream/123456789/18841/1/Unit-6.pdf>

<https://egyankosh.ac.in/bitstream/123456789/9964/1/Unit-20.pdf>

<https://courseware.cutm.ac.in/wp-content/uploads/2020/06/Family-Welfare-Programme-pdf.pdf>

<https://www.insightsonindia.com/wp-content/uploads/2013/09/child-welfare-policies-and-programs-in-india.pdf>

<https://www.youtube.com/watch?v=8AJod8vd2W8>

Pedagogy: Lectures, Audios / Videos followed by discussion, PPT, and Student-led seminars.

Course Designer: Dr.G.Mettilda Buvaneswari

Semester V	Internal Marks :25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22USW5CC8	COMMUNITY DEVELOPMENT	CORE	5	5

Course Objectives

- To know the basic concepts, principles and approaches in Rural, Urban and Tribal Community Development
- To create and develop an in-depth understanding among students about Rural, Urban and Tribal Community Development.

Prerequisites

The learners need to have a basic understanding on Rural/Urban/Tribal community

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Explain the basic concepts, principles and approaches in Rural, Urban and Tribal Community Development.	K1
CO2	Discuss the features of Rural, Urban and Tribal Communities	K2
CO3	Demonstrate the various traditional and conventional methods, strategies, policies, programmes and developmental efforts towards Rural, Urban and Tribal Community Development.	K3
CO4	Examine the Social Structure, Social Relations and Institutions related to Rural and Tribal communities.	K4
CO5	Analyse the role and contribution of Professional Social Worker in the developmental process.	K5

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	3	3	2	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation
– “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Community Development : Concept & Approach Community Development: Meaning, Origin, Principles, Values. Community Development Process: Organizing Visioning, Planning, Implementation, Monitoring and Evaluation. Community Development related concepts and approaches: Community Participation, Community Empowerment, Social Capital, Community Driven Development and Sustainable Livelihoods.	15	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
II	Rural Community Development Rural Community: Characteristics, Problems related to Agriculture and its allied activities. Rural Community Development: Concept, Origin, Gandhian construction programmes and Early experiments of Rural Community Development. Rural Development Agencies: CAPART, NABARD, Regional Rural Development Banks. Rural Development Programmes: MGNREGA, PMGSY, SGSY, NRLM, SSA. Three tier system and Impact of Panchayati Raj system on Rural Community. Gram Sabhas- its role and importance.	15	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
III	Urban Community Development Urban Communities: Characteristics, Rural Urban linkages (Rurban) and Rural-Urban contrast. City - Meaning & Classification. Urbanization & Urbanism. Slums – Concept, Culture of Slums., Corporation, Municipality, Town, City., Urban Community Development: Concept, Origin and Principles. Urban Development Programmes in India - Urban Development Projects. National Urban Livelihood Mission, Swachh Bharat Mission. Urban Development Agencies – National, State, Local Bodies, Structure and Functions. E-Governance in Urban Development , National Urban Information System (NUIS) Nagarpalika Act (74th Amendment), Housing for Urban Poor. CMDA, HUDCO.	15	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
IV	Tribal Community Development Tribal Community: Concept, Characteristics and Types of Tribal Community, Geographical distribution of Tribes, Life Style of Tribes – Socio-economic conditions, Cultural & Religious practices, Belief System, Tribal Institutions – Marriage and Family, Tribal Revolts and Problems of Tribes. Tribal Development Administration & Programmes: Constitutional, Legal and Economic provisions for the protection of Tribes, Functions of Tribal Development Blocks.	15	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
V	Participatory Learning and action Participatory Learning and Action: History, Concept, Principles. Advantages & Limitations. Rapid Rural		CO1, CO2, CO3,	K1, K2, K3, K4, K5, K6

	Appraisal (RRA), Participatory Rural Appraisal (PRA) Definition, history and Principles and Pillars of PRA, Tools: Resource and Social Maps, Mobility Maps, Opportunities Map, Transect Walk Venn Diagrams, Seasonal Calendars, Daily activity charts, Timelines, Matrices, Wealth Ranking.	15	CO4, CO5, CO6	
VI	Self- study for Enrichment (Not to be included for End Semester Examinations) Learners should submit assignments on Commissionerate for Town and Country Planning and Types of Urban Community development Learners need to prepare an e content on Historical background of Panchayati Raj.	-	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

Text Books

- Mello, L. D. (2018) Community Development: Rural, Urban and Tribal perspective, FSP Media Publications.
- Gupta, K.B (2010). Rural development in India, Atlantic Publication.
- Singh, K. (2008). Rural Development: Principles, Policies and Management, Sage Publications.

Reference Books

- Soundarapandian, M (2010). Rural Entrepreneurship: Growth and Potentials, Kanshika Publications.
- Thakur, B. (2005). Urban and Regional Development in India: Vol I New Delhi: Concept Publishing Company.
- Chaubey, P .K.(2004). Urban Local Bodies in India. New Delhi: Indian Institute of Public Administration.
- Singh, K.S (2002). Tribal Situation in India, Indian Institute of Advanced Publication.
- Soundarapandian, M (2001). Tribal Development in India: A Case Study, Anmol Publisher.
- Bhargava, G.(1998). Urban Problems and Policy Perspectives. New Delhi

Web References

1. Indian Society Tribal, Rural & Urban
https://youtu.be/P4JOg_Livb8?si=7j5-BzA2P3bswvgU
2. Participatory Rural Appraisal (PRA)
<https://youtu.be/1uFijkQrex4?si=OAlzgzNlQLrnkNxx>
3. Towards a Swachh Bharat
https://www.pmindia.gov.in/en/government_tr_rec/swachh-bharat-abhiyan-2/

Pedagogy: E content, PPT, Lectures, Group Discussions on research articles & case studies

Course Designer: Dr.G.Kanaga

SEMESTER V	Internal Marks :25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22USW5CC9	INTRODUCTION TO COUNSELLING & GUIDANCE	CORE	5	5

Course Objectives:

- To make the students aware of the concept of Counselling & Guidance
- To understand the theoretical foundations of counselling.
- To explain the counselling Process & phases of Guidance.
- To teach students about the skills & qualities of Counsellor.
- To make students aware about the policies of children.
- To update the students on various Counselling methods & Techniques.

Pre-Requisites:

The learners need to have a basic understanding of counselling & Guidance

Course Outcomes:

On the successful completion of the course, the students will be

CO Number	CO Statement	KNOWLEDGE LEVEL
CO1	Define, Recall, Explain the need, types, process of Counselling& Guidance	K1
CO2	Define, explore the theoretical foundations of counseling	K2
CO3	Apply methods and techniques of counselling& Guidance	K3
CO4	Summarise the skills of application to real life situations	K4
CO5	Categories the role of counselling& Guidance in different fields	K5

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	3	3	3	3	3	2	3	2	3
CO3	3	2	3	3	2	3	3	3	3	3
CO4	3	2	2	3	3	3	2	3	3	3
CO5	3	3	3	2	2	3	3	3	3	3

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to Counselling & Guidance: a. Definition, objectives, principles, need and Importance, types, Scope, skills, Qualities of an effective Counsellor b. Meaning, nature, Need, Types & Functions of Guidance, Principles, Ethical consideration of Guidance & counselling, Difference between Counselling & Guidance, counselling as a helping profession	15	CO1 , CO2 CO3 CO4 CO5	K1,K2,K3,K4, K5
II	Theories of Counselling: Client-Centered or Person-Centered Theory (affective), Rational- Emotive Theory (cognitive) and Behavioural Counselling.	15	CO1 , CO2 CO3 CO4 CO5	K1,K2,K3,K4, K5

III	Methods and Techniques of Counselling & Guidance : Method - Directive, Non-Directive and eclectic counselling. Interview, observation, case study method- meaning, types and procedures. Counselling Techniques: Listening ,Responding, Goal Setting, Exploration and Action, Behaviour Techniques, Psychodrama, Role Play.	15	CO1 , CO2 CO3 CO4 CO5	K1,K2,K3,K4, K5
IV	Counselling Process/ Steps: Relationship building, Problem assessment, Goal Setting, Intervention, Evaluation and Follow- up. Phases of Guidance	15	CO1 , CO2 CO3 CO4 CO5	K1,K2,K3,K4, K5
V	Counselling in Various Settings: Community counselling, mental health, disaster affected and correctional setting; industrial counselling, marriage counselling, career counselling, family counselling .Counselling practice with the special groups: children, adolescent, youth, women, alcoholic and drug addicts, aged, HIV/ AIDS infected, Differently abled Transgender Areas of Guidance- Personal, Social, vocational, educational	15	CO1 , CO2 CO3 CO4 CO5	K1,K2,K3,K4, K5
VI	Self Study for Enrichment (Not to be included for External Examination) Learners will be given an assignment to visit different Counselling settings & Prepare a Presentation	-	CO1 , CO2 CO3 CO4, CO5	K1,K2,K3,K4, K5

References:

- Aggarwal, J.C. (1989). Educational and Vocational Guidance and Counselling, Doaba House; Delhi
- Aggarwal, J.C. (1998). Career Information in Career Guidance: Theory and Practice, Doaba House, Delhi.
- Bond, Tim (2010). Standards and Ethics for Counselling in Action, SAGE Publications.
- Burnard, Philip (2002). Counselling Skills Training (A Sourcebook of Activities for Trainers), Viva Books Private Limited. Cochran, Larry (1997).
- Crow, Lester D. & Crow, Alice (1962). An Introduction to Guidance: basic principles and practices, Eurasia publishing House (p) LTD, New Delhi. Syllabus
- Dev, Kapil (2006). Educational Counselling, Pragun Publications, New Delhi
- Gibson, Robert L. & Mitchell, Marianne H. (2012). Introduction to Guidance and Counselling ,Prentice Hall of India, New Delhi.
- Gupta, Manju (2003). Effective Guidance & Counselling modern Methods and Techniques, Mangal Deep Publications, India.

- Kocher, S. K. (2007). Educational Guidance and Counselling, New Delhi: Sterling.
- Kinra, Asha K. (2012). Guidance and Counselling, Pearson Publication.
- Kochhar, S.K. (2010). Educational and Vocational Guidance in Secondary Schools, Sterling Publishers, New Delhi.
- Kottler, Jeffery A. & Shepard, David S. (2009). Counselling Theories and Practices, CENGAGE Learning.
- Lakshmi, K. S. (2006). Encyclopaedia of Guidance and Counselling (Part – I: Strategies for Guidance and Counselling / Part – II: Educational Guidance and Counselling / Part – III: Social Guidance and Counselling / Part – IV: Personal and Vocational Counselling), A Mittal Publications, New Delhi.
- McLeod, John (2008). An Introduction to Counselling, Rawat Publications. 15. McLeod, J. (2013) An Introduction to counselling. McGraw-Hill Education. New Delhi.
- McLeod, John (2013). Person - Centred Counselling in Action, SAGE Publications.
- Nag, Dr. Subir (2012-13). Counselling and Guidance, Rita Publication, Kolkata.
- Nathan, Robert & Hill, Linda (2012). Career Counselling, SAGE Publications
- Nelson-Jones, Richard (2008). Basic Counselling Skills, A Helper's Manual, SAGE Publications India Pvt. Ltd.
- Rao, S. Narayana & Sahajpal, Prem (2013). Counselling and Guidance, Page 6 of 26 McGraw Hill Education, New Delhi.
- Soundarajan, R. (2017). Counselling: Theory, Skills and Practice McGraw Hill Education. New Delhi.
- Sharma, Ramnath and Sharma, Rachana (2007). Guidance and Counselling in India, Atlantic Publishers and Distributors, New Delhi.
- Srivastava, Sushil Kumar (2007). Career Counselling, ATLANTIC Publishers & Distributors (P) LTD.

Web Resources:

<https://www.webmd.com/mental-health/what-is-rational-emotive-behavior-therapy>
[Behavioral Therapy: Definition, Types, Techniques, Efficacy \(verywellmind.com\)](#) [Counselling: Meaning, Techniques, Types and Problems \(yourarticlelibrary.com\)](#) [10.pdf \(aiu.edu\)](#) [Unit-3.pdf \(egyankosh.ac.in\)](#)

<https://www.youtube.com/watch?v=V4OFaLvIlQo>

<https://www.youtube.com/watch?v=IJXSf-cx8V8>

<https://www.youtube.com/watch?v=HOi48z4g45Q>

<https://www.youtube.com/watch?v=Jz55Uk9EH6U>

Pedagogy: PPTs, Videos, Case discussion, Group Discussion

Course Designer: Ms. PL. Rani

SEMESTER-V	INTERNALS -40		EXTERNALS-60	
COURSE CODE	FIELD WORK PRACTICUM (P)	CATEGORY	HOURS/WEEK	CREDITS
22USW5CC3P		CORE	5	5

Course Objectives

- o To deepen the students' knowledge of social problems.
- o To sensitize students on current social problems and issues.
- o To develop skills in analysis and interpretation of social problems.

Prerequisites

To apply and to integrate classroom learning into practical field to perceive Professional practices of Social workers

Course Outcomes and Cognitive Level Mapping

On the successful completion of this course, the students will able to

CO Number	CO Statement	KNOWLEDGE LEVEL
CO1	Recall, Demonstrate and Examine the practical application of social work methods	K1,K2,K4
CO2	Identify the need of Professional practices into various Fields of Social Work	K3
CO3	Analyse Skill based intervention into existing Social Issues and Social Problems	K4
CO4	Assess the current situations with adequate knowledge for pragmatic solutions	K5

Mapping of CO with PSO and PO

Cos	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation –“-” indicates there is no correlation

Syllabus

The aim of this Group Project is to Enhance the students' understanding of current social problems through group projects. Each group must have a minimum of three and a maximum of five members. Each group must take up a current social issues/problem in consultation with the field work supervisor. Students may be creative in submitting their work in the form of a report, album, videos, a survey or combination all etc.

TOPICS RELATED TO:

- Children
- Women
- Elderly
- Environment
- Vulnerables
- Labourers/Workers
- Any current/ contemporary social issues

METHOD OF ASSESSMENT

Internal	Marks
Attendance in Field Work	5
Individual Participation in Group Project	10
Regularity and Use of Field Work Supervision	15
Team Work	10
Total	40

External	Marks
I. REPORTING	20
II.VIVA VOCE	
1. Theoretical Knowledge	10
2. Communication and Language	5
3. Project Presentation	10
4. Objectives Fulfilled	5
5. Clarity on Project	10
Total	60

Pedagogy: Observation, Interaction, Discussion, Book Review, Collection of Information pertaining to current affairs, Social issues and problems, Documentation(Audio, Video evidences, Case Study, Collection of paper clippings, Preparation of Albums)

Course Designer: Ms.S.Hema

SEMESTER V	Internal Marks:25		External Marks:75	
COURSECODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22USW5DSE1A	BASICS OF DISASTER MANAGEMENT	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives

The purpose of this course is to help the students to understand about Disaster and the role of social worker in disaster management

Prerequisites

The learners need to have a basic understanding of disaster and its types

Course Outcomes and Cognitive Level Mapping

On successful completion of the course the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Outline the concept associated with disaster	K1
CO2	Identify the types of Disaster	K2
CO3	Summarize the legislations on Disaster	K3
CO4	Discuss the role of central government and State Government in disaster	K3
CO5	Demonstrate the importance of Capacity Building	K4

Mapping Course Outcome with Programme Outcome

Cos	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	2	3	3
CO2	3	2	2	3	3	3	3	2	3	2
CO3	3	2	2	3	2	3	3	2	3	2
CO4	3	2	3	2	3	3	3	3	3	3
CO5	3	3	3	3	2	3	2	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Definition and concept–Disaster, Hazards, Vulnerability., Disaster Management Definition concept and Importance, Disaster management cycle.	12	CO1,CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5,K6
II	Natural Disaster- Flood, Drought, Cyclone, Earthquake, tsunami Manmade Disaster- Communal Violence, Ethnic conflicts, Terrorism Other Disasters- Epidemics, Fire, Industrial Disaster Road, Railway and Air Accidents	12	CO1,CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5,K6
III	National disaster Management Plan , Disaster Management Act 2005, Impact of Disaster-Physical, economical Psycho social and social exclusion	12	CO1,CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5,K6
IV	Role of international and national institution, NGO, central and State Government in Prevention, Mitigation, Preparedness, Response, Relief and Rehabilitation	12	CO1,CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5,K6
V	Capacity Building-institutional capacity Development, Training of Communities, need for Disaster Management in Educational Institutions. Usages of GIS and Remote sensing techniques in disaster management	12	CO1,CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5,K6
VI	Self study for Enrichment (Not to be included for End Semester Examinations) Discussion on case studies, problems of Disaster Survivors, Government role in various Disasters rescue and Rehabilitation	-	CO1,CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5,K6

References

- Dave,A.S., Sekar,K., Bhadra,S., Rajashekar,GP, Kishore Kumar,K., Srinivasa Murthy,R. 2002
- Riots: Psychosocial care for Individuals. Books for Change, Bangalore. In English and Gujarati.
- Goel.S.L.,(2005) Encyclopedia of Disaster Management, Deep and Deep Publications Pvt Ltd, NewDelhi
- Nadkarni, V.V. (1991) Developing curriculum in the area of Disaster Management. In
- S. Bharat and M. Desai (Eds) Research on Families with Problems in India: Issues and implications (Volume I), Bombay: Tata Institute of Social Sciences.
- Narayana R.L., Srinivasa Murthy,R., Daz P (2003) Disaster mental health in India: Monograph. American Red Cross. Indian Red Cross, New Delhi
- National Institute of Mental Health and Neurosciences 1997 Report on National workshop on Psychosocial

consequences of disasters, Bangalore

Web sources

<http://www.ndma.gov.in>

You tube links

<https://www.youtube.com/playlist?list=PLldEapv0nG313rAG2nZJvQa2TuqV1nOsr>

<https://www.youtube.com/watch?app=desktop&v=X-U-UB6TJQ0>

<https://www.youtube.com/watch?v=VvdW4fsIVv4>

Pedagogy-Assignment, Seminar, discussion, E-content, PPT,

Course Designer-Dr. R.Anitha

SEMESTER V	Internal Marks :25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22USW5DSE1B	WELFARE OF VULNERABLE	Discipline specific Elective-I (DSE)	5	4

Course Objectives

To make the students to understand on the concepts of vulnerable

Prerequisites

The learners need to have a basic understanding of vulnerability

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	COGNITIVE LEVEL
CO1	Define the concept of vulnerable	K1,K2
CO2	Explain the problems of vulnerable, Identify the welfare schemes of vulnerable	K1,K2
CO3	Demonstrate the role of social workers in welfare of the vulnerable, Examine the problems of vulnerable.	K3,K4
CO4	Compare the Welfare Programmes for the vulnerable	K4
CO5	Judge the important Acts & schemes for vulnerable	K5

Mapping of CO with PSO and PO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Vulnerable Sections Vulnerable: Definition, Concept. Types of vulnerability., Vulnerability due to Caste-SC, ST, OBCs ,Vulnerability of children, women, elderly, differently abled ,Poor migrants and Transgenders	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5, K6
II	Welfare measures for the Vulnerable National Commissions for SCs, STs., Most Backward Classes and Minorities.Welfare Department-Tamil Nadu., National Commission for Women., Rashtriya Mahila Kosh., Child Welfare Committee., Department of Empowerment of Persons with Disabilities (Divyangjan), One Nation One Ration Card scheme (ONORC)., Transgender Welfare Board-Tamil Nadu.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Problems of Children , Women and Elderly. Child labour, child marriage, child abuse, Female infanticide, Sex- selective abortion, dowry death, Rape and Domestic Violence., Vulnerability of elderly in economic dependency and health care access.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Differently abled ,Poor Migrants and Transgenders Differently abled: problems., Poor Migrants: Problems., Transgenders: stigma and discrimination., Role of Social Workers in the welfare of vulnerable Section.	15	CO1,CO2,CO3,CO4,CO5	K1,K2,K3,K4,K5, K6
V	Important Acts & schemes for Vulnerable section National SC/ST Hub, Prevention of Atrocities (Scheduled Caste and Scheduled Tribes) Act., 1989., The 'Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013' (MS Act, 2013)., Ujjawala scheme for Women., the Sexual Harassment of Women At Workplace (Prevention, Prohibition And Redressal) Act, 2013., the National Children Fund., Pradhan Mantri Awas Yojana,2015.,Pradhan Mantri Vaya Vandana Yojana., Assistance to Disabled Persons for Purchase / Fitting of Aids and Appliances (ADIP Scheme)., 'Garib Kalyan Rozgar Abhiyaan'., Support for Marginalized Individuals for Livelihood and Enterprise(SMILE).	15	CO1,CO2,CO3,CO4,CO5	K1,K2,K3,K4,K5, K6

VI	Self-study for Enrichment(Not included for End Semester Examinations) Learner should prepare an E content on Welfare schemes for vulnerable in India		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

- D. Miles Burkholder, Nicole Bremer Nash .(2014). Special Populations in Health Care, Jones & Bartlett Learning,USA.

Reference Books

- Asha Rani. (1986). Children in Different situation in India – A Review, Bombay, Tata Institute of Social Sciences.
- Bhargava Vinita. (2005). Adoption in India, New Delhi, Sage Publications.
- Desai, Murli and Raju Siva.(2000). Gerontological Social Work in India - Some issues and Perspectives. Delhi, BR Publishing
- Dey, A. B (Ed.) (2003). Ageing in India: Situation Analysis and Planning for the Future. New Delhi / WHO and AIIMS.
- Giardino, A.R., Christian, C.W., Giardino, E.R. (1997) A practical guide to the Evaluation of child physical abuse and neglect, Sage Publication: New Delhi.
- Gupta, M. (1998) International Encyclopedia of women's Development, New Delhi.:Sage Publications.
- Government of India. (1992). A Commitment to the Child Women and Child Development, Dept. of Plan of Action.
- Indira Jaiprakash. (1999). Aging in India, A report submitted to World Health Organization, Geneva.
- National institute of public co-operation & child development. (1994). The child in India –a statistical profile New Delhi : NIPCCD
- Venkatesan. S. (2004). Children with Developmental Disabilities, New Delhi, Sage Publications.
- Dandekar, Kumudini. (1996). The Elderly in India, New Delhi, Sage Publications.

Web Resources

- The vulnerable groups: women and children -
egyankosh<http://egyankosh.ac.in/bitstream/123456789/43141/1/Unit-9.pdf>
- Social Justice Welfare Schemes for Vulnerable Sections Part - 1
<https://www.youtube.com/live/W0jPiLSDtjc?si=zSYIDiWU9FB1-iOx>
- Welfare schemes for Vulnerable sections of the society
<https://youtu.be/qWzXrmm9IOk?si=hFsDeUJuVzCgWMAo>
- http://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/social_work_education/social_welfare_&_development_administration/03_welfare_schemes_and_programmes_of_government_of_india/et/6065_et_et.pdf
- <https://egyankosh.ac.in/handle/123456789/26107>
- <https://youtu.be/YQbPPnLZyVo?feature=shared>
- <https://youtu.be/BpBWWwLpwNM?feature=shared>

Pedagogy: Chalk & talk, e -content, Group Discussions, Videos, Quiz & Assignments Course Designer: Dr.O.Aisha Manju

SEMESTER V	Internal Marks:25		External Marks :75	
COURSECODE	COURSE TITLE	CATEGORY	Hours/ Week	Credits
22USW5DSE1C	HUMAN RIGHTS AND SOCIAL WORK	Discipline Specific Elective – I (DSE)	5	4

Course Objectives:

- To impart knowledge on most essential concepts on human rights
- To enrich knowledge about voluntary organizations working at the International, national and state level.
- To learn basic rights can also understand the duties to be enacted in the future.
- To understand about human right violation
- To highlight various legislations related to protection weaker section people

Pre-requisites

The learners need to have a basic understanding about Human Rights

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Define, identify, the concept of human rights & its types	K1, K2
CO2	Identify the historical origin of human rights national & international level	K3
CO3	Identify & Examine fundamental rights the Indian constitutional guarantee of human rights & legislations pertaining to Human rights	K4
CO4	Explain the Human Rights Challenges and Issues of Vulnerable Groups	K5
CO5	Discuss the role of National & International level Organisations working for Human Rights	K6

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	2	1	1	1
CO2	3	3	3	2	3	2	3	1	1	2
CO3	3	2	3	3	3	3	3	3	1	3
CO4	3	3	3	3	3	3	2	2	1	1
CO5	3	3	2	2	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation –
 “-” indicates there is no correlation.

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	INTRODUCTION Meaning of human rights, Concept of human rights, historical background, constitutional provisions, Human Rights Act – objectives and framework, National Human Rights Commission, State Commission. Social Work as a Human Rights Profession.	15	CO1 ,CO2 CO3 CO4 CO5	K1,K2,K3,K4, K5
II	HUMAN RIGHTS AND COMMUNITY Human rights and democracy, disability, environmental, air and water pollution, education, freedom of speech and expression, religion, marriage, reservation in favour of SC/ST. The Rights of immigrants, asylum-seekers and refugees. A rights-based approach to social work practice	<u>15</u>	CO1 ,CO2 CO3 CO4 CO5	K1,K2,K3,K4, K5
III	CLASSIFICATION OF HUMAN RIGHTS. a. Right to Life, Liberty and Dignity b. Right to Equality c. Right against Exploitation d. Cultural and Educational Rights e. Economic Rights f. Political Rights g. Social Rights.. Non-discrimination and equality as human rights principles. Tackling heterosexism and ableism as human rights concerns	15	CO1 ,CO2 CO3 CO4 CO5	K1,K2,K3,K4, K5
IV	INTERNATIONAL CONVENTIONS ON HUMAN RIGHTS: Human Rights Committee, UDHR, ICCPR, ICESCR, Convention Against Torture, Convention on Elimination of All Discrimination, Child Right Convention Employing a rights-based approach to social work practice with women and children.	<u>15</u>	CO1 ,CO2 CO3 CO4 CO5	K1,K2,K3,K4, K5
V	HUMAN RIGHTS MOVEMENTS IN INDIA.: Peoples Union for Civil Liberties (PUCL), Environmental	<u>15</u>	CO1 ,CO2	K1,K2,K3,K4, K5

	Movements .Challenges to Human Rights in India: Human Rights violation Among minorities, Dalits and Adivasis, women, children and other marginalized sections. State and Human Rights: Police Atrocities India .Responding to current crises. Self-care in human rights and social work. Group presentations			
VI	Self-Study for Enrichment (Not to be included for External Examination) Learners will be given an assignment on the topics and activities of the organization working for Human Rights		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

TextBook:

Kohli S. A (2004) “Human Rights and Social Work- Issues, Challenges and Response”.KanishkaPublishers, New Delhi

Reference Books

- Antony, M.J(2001).Landmark Judgements on Bonded Labour, Dowry Related Deaths, Children’s Rights, “ Illegal Custody &Police Torture. Indian Social Institute, NewDelhi2001,
- Chakraborty, Somen Human Rights Trainer’s Manual ,Indian Social Institute, New Delhi2004
- Mathew P.D & P.M. Mathew, Indian Legal System : An Overview, Indian Social Institute New Delhi 2005
- Menon, N.R. Madhava, A Training Manual for Police on Human Rights, Human , National Law school of India University, Bangalore. National Law School of India University 1997
- Pandey, P.N, Constitutional Law of India, Central LawAgency,Allahabad2000
- Shanmugavelayutham, K.Social Legislation and Social Chang Vazhga Valamudan Publishers,Chennai1998

Web Resources:

- [University of Minnesota Human Rights Library](#)
- [Human and Constitutional Rights -Web Resources and Documents](#)
- Historicaldictionaryofhumanrightsandhumanitarianorganizations.RobertF.Gorman,Edwar dS.Mihalkanin.2nded.Lanham,Md.:ScarecrowPress,2007
- FirestoneLibrary:Non Circulating (Fnc)JC571.G6552007

Pedagogy:Lectures,Groupdiscussion,PPTpresentation,Casestudyandseminars

Course Designer: Ms. P.Meenakshi

SEMESTER V	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22USW5SEC2P	SOCIAL ENTREPRENEURSHIP (P)	SKILL ENHANCEMENT -II	2	2

Course Objective

This Course aims to make the students to understand the concepts of social entrepreneurship and to enable them with necessary skills

Course Outcomes and Cognitive Level Mapping

On Successful completion of this course, the students will be able to:

CO Number	CO Statement	KNOWLEDGE LEVEL
CO1.	Define the concepts of Social Entrepreneurship	K1
CO2.	Demonstrate the skills of interacting, Brainstorming	K2
CO3.	Develop adjustment and Group learning towards identifying solutions to Social problems, problem solving techniques.	K3
CO4.	Discover Entrepreneurial skills and ideas to associate with Social entrepreneurship	K4

Mapping of CO with PSO and PO

CO/PO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO1	PO2	PO 3	PO4	PO5
CO1	3	3	2	3	3	3	2	2	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	2	3	3	3	3	2	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2

“1” Slight (LOW) Correlation –“2” Moderate (Medium) Correlation –“3”-Substantial (High) Correlation–“-“ Indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Entrepreneurship: Meaning types and features Activity: Group discussion on meaning types and features of Entrepreneurship	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Social Entrepreneurship: Meaning, Importance, Types Activity: Submit an assignment on the role of social entrepreneurship in society	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Introduction to Innovation Creativity, Types of Innovation, Relevance of Technology for Innovation Activity: Students will have to submit assignment on Relevance of Technology for Innovation	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Characteristics and functions of entrepreneur, types of entrepreneurs, Social Innovation & Entrepreneurship in India. Activity: Group discussion on opportunities and challenges for Social Innovation & Entrepreneurship in India.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Impact of Social Enterprises, Social Entrepreneurial Role Models. Activity: Groupwise Power point presentations on Social Entrepreneurial Role Models - Mohammed Yuns, Bunker Roy, Jerro Billimoria, Anshu Gupta, Vijaya Mahajan, Azim Premji.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Enrichment (Not For Examination) Develop, write, and present a social project proposal and business plan	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

SKILL ENHANCEMENT COURSE (SEC. II):

Assessment Rubrics For 100 Marks

Internal :40 Marks

1. Participation In Activities	– 20 Marks
2. Case Study Presentation	- 20 Marks

40 Marks

External: 60 Marks

1. Reporting & Documentation	-20 Marks
2. Theoretical Knowledge	-20 Marks
3. Communication and Presentation	-10 Marks
4. Attitude & Commitment	-10 Marks

60 marks

Pedagogy: Video Lectures, Discussions, Case Study presentations.

Course Designer: Dr. G. Kanaga



Cauvery College for Women (Autonomous), Trichy-18

PG & Research Department of Social Work

MASTER OF SOCIAL WORK

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2023-2024 onwards)

SEMESTER-I

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course– I (CC)	Social Work Profession	23PSW1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Social Case Work	23PSW1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Social Group Work	23PSW1CC3	6	5	3	25	75	100
	Core Practicum - I (CP)	Field Work -I (P)	23PSW1CC1P	6	5	3	40	60	100
	Discipline Specific Elective Course-I (DSE)	Sociological and Psychological Foundations for Social Work	23PSW1DSE1A	6	3	3	25	75	100
		Society and Human Behaviour	23PSW1DSE1B						
		Communication for Social Work	23PSW1DSE1C						
	Total				30	23			

SEMESTER-II

II	Core Course– IV (CC)	Community organization and Social Policy	23PSW2CC4	6	5	3	25	75	100
	Core Course – V (CC)	Indirect Methods of Social Work	23PSW2CC5	6	5	3	25	75	100
	Core Practicum - II (CP)	Field Work – II (P)	23PSW2CC2P	6	5	3	40	60	100
	Core Choice Course– I (CCC)	Counselling: Theory and Practice	22PSW2CCC1A	6	4	3	25	75	100
		Psychology for Social Workers	22PSW2CCC1B						
		Youth and Marginalized Sections	22PSW2CCC1C						
	Discipline Specific Elective Course-II (DSE)	Family Social Work	22PSW2DSE2A	6	3	3	25	75	100
		Disaster Management	22PSW2DSE2B						
		Health and Hygiene	22PSW2DSE2C						
	Internship	Internship	22PSW2INT	-	2	3	-	100	100
	Extra Credit Course	Swayam Online Course	To be fixed later	To be fixed Later					
	Total			30	24				600

SEMESTER-II	INTERNAL -25		EXTERNAL-75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
23PSW2CC4	COMMUNITY ORGANIZATION AND SOCIAL POLICY	CORE	6	4

Course Objectives

- o To facilitate Communities towards self-directed change
- o To justify the importance of theories, practices and approaches of Community Organization and importances of Social Policy

Prerequisites:

Basic knowledge on communities and Social Policy

Course Outcomes and Cognitive Level Mapping

CO NO	CO Statements	Cognitive Level
CO1	Remember and understand the history of Community Organization and basic concepts of Community Organization	K1, K2, K3, K4, K5, K6
CO2	Analyze the process of Community Organization and Social Action	K1, K2, K3, K4, K5, K6
CO3	Evaluate the importance of Community Participation in Rural, Urban & Tribal Development	K1, K2, K3, K4, K5, K6
CO4	Justify the importance of theories, practices and Approaches and models in Community Organisation .	K1, K2, K3, K4, K5, K6
CO5	Analyse Social Policy and its importance	K1, K2, K3, K4, K5, K6

Mapping of CO with PSO and PO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	1	3	3	1	3	2	1	1	1
CO2	1	2	1	2	1	2	3	1	1	2
CO3	3	1	1	2	1	3	3	3	1	3
CO4	1	1	2	3	2	3	2	2	1	1
CO5	3	1	1	2	2	1	1	2	3	3

“1”-Slight (Low) correlation,

”2”-Moderate (Medium) Correlation

”3”-Substantial (high) Correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Community: Meaning, Classifications, and Characteristics; Community Power Structure; Community Dynamics: Integrative and disintegrative processes in the community. Concept of Community development. Similarities and Differences between Community Development and Community Organization, History of Community Organization.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Community Organization: Concept, definition, objectives, philosophy, approaches, principles and skills; Community Organization as method of social work; Phases Of Community Organization: Community relationship, Study, Analysis, Assessment, Discussion, Organization, Action, Evaluation, Modification and Continuation. Models of Community Organization.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Community Organisation Practice: Focus Groups; Analysis of Power Dynamics in Various Community Mobilization for Participation, Involvement in Problem solving Process, Identification of Needs, Issues, Prioritization, Problem Analysis, Selection of Alternatives, Community based Organisation Building and Federating for Sustained Problem-Solving Action. Strategies in Community Organisation; Organising Conferences, Training programmes, Consultation, Negotiation and networking.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Application of Community Organisation: Community Organisation in different fields- Health, Education, Correctional, Rural, Urban and Tribal Communities, Vulnerable sections, Disaster, Displaced Population and Rehabilitation, Peace and Peace building, Empowerment of Marginalised Groups and communities, Practice skills, Research skills for Community Work, Various Roles of Community Organiser.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

V	Social Policy: Definition, Need, Evolution and Constitutional base; Sources and instrument of Social Policy, Policies regarding other backward Castes (OBCs), Scheduled Castes (SCs), Scheduled Tribes (STs) and Denotified Communities. Policies and Programmes for Women, Children, Aged, Disabled, development and implementation of programmes for weaker sections	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self study for Enrichment (Not Included for End Semester Examinations) Caste system in India, Theories of Caste system, Social Inequality & Exclusion, Patterns of Social Mobility, Leadership, and theories of Leadership, Community Participation, Community Organization as a macro method, Community work, Nature of Different Communities with their strength and weakness, Current issues in Community Organization, Gender sensitivity issues in Community Organization,	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

- Joseph, S.(2012). Community Organization in Social Work, Discovery Publishing house.
- Lee, B.(2011). Pragmatics of Community Organization, Common Act.

References

- Guha, A. (2013) .Community Organization and Social Action, Centrum press.
- Patil, A.R (2013) Community Organisation and Development: An Indian Perspective New Delhi: PHI Learning
- Joseph, S.(2012). Community Organization in Social Work, Discovery Publishing house.
- Lee, B.(2011). Pragmatics of Community Organization, Common Act.
- Christoper, A.J & William A.T (2009)Community Organisation and Social Action New Delhi: Himalaya Publishing.
- Rothman. J(2001) Strategies of Community Interventions and Macro Practice(6th Ed)
- Sidduque,H.Y.(1997).Working with Communities: An Introduction to Community Work, Hir
- Ross,M. G.(1955).Community Organization: Theory and Principles Social Policy and Adminstration,

Web References

- <https://mgkvp.ac.in/Uploads/Lectures/32/2531.pdf>
- <https://www.notesonzoology.com/ecology/communities-meaning-types-and-characteristics-zoology/4324>
- <http://ignou.ac.in/upload/bswe-03-block1-unit-1-small-size.pdf>
- <https://egyankosh.ac.in/bitstream/123456789/50437/1/Block-2.pdf>
- <https://ctb.ku.edu/en/table-of-contents/assessment/promotion-strategies/systems-advocacy-and-community-organizing/main>
- <https://www.strath.ac.uk/courses/undergraduate/politicsinternationalrelationsocialpolicy/whatisocialpolicy/>
- <https://www.hellovaia.com/explanations/social-studies/theories-and-methods/social-policy/>

Pedagogy

Chalk& Talk, Seminar, PPT Presentation, Group Discussion and Case Study

Course Designer :Dr.G.Kanaga

SEMESTER-II	INTERNAL -25		EXTERNAL-75	
COURSE CODE	INDIRECT METHODS OF SOCIAL WORK	CATEGORY	INSTRUCTIONAL HOURS	CREDITS
23PSW2CC5		CORE	6	5

Course Objectives

To acquire Knowledge on application of Indirect Methods in Social Work, Social Welfare Programmes.

Prerequisites

Basic knowledge on indirect methods of Social work

Course Outcome

On the successful completion of the course the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Explain the concept of Social Welfare Administration	K1
CO2	Explain the Social Welfare Agencies	K2
CO3	Explain the concept of Social Work Research	K3
CO4	Examine the features of Statistics	K4
CO5	Evaluate the need and role of Social Action	K5

Mapping of CO with PSO and PO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	2	3	2	2	2	2
CO2	2	2	2	2	2	2	3	2	2	2
CO3	3	2	2	2	2	3	3	3	2	3
CO4	2	2	2	3	2	3	2	2	2	2
CO5	3	2	2	2	2	2	2	2	3	3

“1”- Slight (Low) Correlation, “2”- Moderate (Medium) Correlation,

“3”- Substantial (High) Correlation

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Social Welfare Administration: Meaning and definition of Social Welfare Administration and Social Work administration; Purpose, principles, functions and areas (Policy making, , fund raising, accounting, auditing, record maintenance, co- ordination, public relation, monitoring and evaluation); Social Welfare Administration at National, State and local levels; CSWB & SSWB, Directorate of Social Welfare and Department of Empowerment of Persons with Disabilities, Functions of DDRO	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

II	Social Welfare Programme and Agencies: Evaluation of Social Welfare in India; Voluntary Social Work, Social Agencies: Meaning, definition, type and models of NGOs; Roles of NGOs in National Development. Governmental Schemes on Social Welfare. Registration of NGOs: Governing Board, committees. Executives: Roles and Functions	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Social Work Research: Meaning, Definition, Objectives, characteristics, Types-Qualitative and Quantitative and difference between qualitative and quantitative: Research. Problem Formulation;;Variables: meaning, types of Variables Hypothesis: meaning, sources, characteristics, functions and types; attributes of a sound hypothesis;.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Research Design, Data Collection and Statistics: Research Design: Meaning and types- exploratory, descriptive, diagnostic, experimental. Universe and Sampling: Meaning, Principles and types of sampling; Tools, Sources and Methods of Data collection, Reliability and Validity . Data Processing; Editing, Sorting, Coding, transcription. Presentation of data: tabular and graphical presentation; Report Writing: content, format and types; footnotes, Referencing bibliography: plagiarism; ethics and qualities of good researcher; preparation of research project proposal; Statistics: meaning, definition, use its limitations in Social Work Research: Measures of Central Tendency and Dispersion. Computer applications: use and in Social Work Research	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Social Action : Definition, objectives, principles, methods and strategies; Radical Social Work, Saul Alinsky and Paulo Freire's methods; Process of Social Action; Scope of Social Action in India; Role of Social Workers in Social Action.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	(Self study for Enrichment (Not included for End Semester Examinations Learners will be given as assignment to select a topic and carry out the steps of research. Case Study and Focussed Group Discussion to be carried out . Statistical packages for Social Sciences- Dispersion; range, quartile deviation, standard deviation and coefficient of variation ; Test of significance; t test F test and Chi-square test; Correlation; meaning , types, and uses; Karl Pearson's coefficient of correlation and rank correlation. Advantages of Social action, Examples of social Action in India and abroad	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

References:

- Bhattacharya, Sanjay. Social Work Administration. Jaipur:Rawat Publication, 2006
- Sachedeva, D.R. Social Welfare Administration, New Delhi: Kitab Mahal,2009
- Goel, S.L. Social Welfare Administration: Social Justice and Empowerment. Vol 1&2 New Delhi: Deep and Deep Publication Pvt, Ltd., 2010
- Ranjana, Devi. Social Welfare: Concepts and Theory. New Delhi: Omega Publications,2009
- Choudry, Paul Hand book on social welfare in India, streling pub, New Delhi, 1979
- Choudry, Paul Social Welfare Administration, Atma Ram & Sons, Delhi, 1979.
- Kothari CR (2004) Research Methodology Methods and Techniques, New Delhi
- SchuttbRussell K (2011) Investigating the social world:The process and practice of Research, Pine Forge Press
- Rubin, Allen and Earl Babbie (2016) Empowerment Series: ResearchMethods of Social Work,Cengage Learning
- Guha A (2013) Community Organisation and Social Action, Centrum Press
- Christoper, AJ &William A.T (2209) Community Organisation and Social Action, New Delhi: Himalaya Publishing
- Siddique, H.Y.(1984) Social Work and Social Action, Hira Publications

Web Resources

https://www.youtube.com/watch?v=D02XA_UdJIg

https://www.youtube.com/watch?v=bKKM_b15kIA

<https://www.youtube.com/watch?v=8Li0EWfWZQg>

Pedagogy: Lectures, Group discussion, PPT presentation, Case study and seminars.

Course Designer: Dr. G. Kanaga

SEMESTER II	INTERNAL:40		EXTERNAL :60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
23PSW2CC2P	FIELD WORK – II (P)	CORE	6	5

Course Objective

To provide opportunities to the students for applying the knowledge and the information gained in the class room to reality situations.

Pre requisites

Basic understanding of fields of Social Work

Course outcome and Cognitive Level Mapping

On successful completion of this course, Student will be able to

Course Outcomes		
CO Number	CO Statement	KNOWLEDGE LEVEL
CO1	Understanding both the agency and the client as systems	K2
CO2	Develop knowledge of administrative procedures, programme management and utilizing the skills in practice	K3
CO3	Analyse the skills of problem solving process and practice	K4
CO4	Interpret the different social issues and social welfare agencies	K5
CO5	Modify Solutions Based on need of the Client	K6

Mapping of CO with PSO and PO

Cos	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	2	3	3	3	3	2
CO2	2	3	2	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	2
CO4	3	2	2	2	2	3	3	2	2	2
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

1. Concurrent field work - agency placement in generic setting of practice such as schools/old age homes/counselling centres/rehabilitation settings etc. to initiate and participate indirect delivery
2. The placement will be for a minimum duration of 30 Field Work days for 2 days per week/semester and report to be submitted during faculty and Student Individual conference.
3. Importance to be given for the practice of Social Work methods. Each student is expected to conduct case work with a minimum of 3 clients, group work with at least 2 groups, and organise one community based programme.

Method of Assessment

Internal - 40 marks

S.NO	INTERNAL	MARKS
1	Case Work Practice	10
2	Group Work	10
3	Community Programme	10
4	Reporting	5
5	Attendance for Field Work	5
Total		40

External – 60 Marks

S.NO	EXTERNAL	MARKS
1	Theoretical Knowledge	20
2	Agency Evaluation	20
3	Mobilizing Resources	10
4	Communication and Presentation	10
Total		60

Pedagogy: Observation, Case Study and Field Visits

Course Designer:Ms.S.Hema



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18

PG & RESEARCH DEPARTMENT OF SOCIAL WORK

MASTER OF SOCIAL WORK

LEARNING OUTCOME BASED CURRICULUM FRAME WORK(CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022-2023 onwards)

SEMESTER-IV

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			
						Hrs	Internal	External	Total
IV	Core Practicum-IV (CP)	Social Work Practicum (P)	22PSW4CC4P	6	5	3	40	60	100
	Core Practicum -V (CP)	Block Placement (P)	22PSW4CC5P	6	5	3	40	60	100
	Core Choice Course– III (CCC)	Specialization III Psychiatric social work	22PSW4CCC3A	6	4	3	25	75	100
		Welfare of the youth and Aged	22PSW4CCC3B						
		Organisational Behaviour	22PSW4CCC3C						
		Development Planning, Policy and Practice	22PSW4CCC3D						
	Generic Elective Course-II (GEC)	Women Development	22PSW4GEC2	3	2	3	25	75	100
	Research Project	Research Project Work	22PSW4PW	9	5	3	Evaluation 80 Viva 20		100

SEMESTER IV	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PSW4CC4P	SOCIAL WORK PRACTICUM	CORE PRACTICUM IV	6	5

Course Objectives

1. To expose students to various fields of Social Work Practice.
2. To enable the students to apply theoretical knowledge.
3. To enable students to gain professional intervention skills and program/process implementation skills
4. To help the students to develop skills in documentation.
5. To equip students to develop personal and professional self.

Pre –requisites

The learner will get a Practical exposure in various fields of Social Work

Course Outcome

On the Successful completion of this course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1.	Develop knowledge regarding the Specialized Area	K3
CO2.	Survey the numerous problems of the Clients in the specialized area.	K4
CO3.	Deduct the specific problems of the client group.	K5
CO4.	Recommend an area of a mini research study.	K6
CO5	Plan policies and programmes based on the findings of the mini research study.	K6

Mapping of CO with PSO and PO

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	2	2	2
CO2	3	3	3	3	3	2	2	2	2	2
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	3	3	2	2	2	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1” Slight (LOW) Correlation –“2” Moderate (Medium) Correlation “3”-

Substantial (High) Correlation--“-“ Indicates there is no correlation

Syllabus

1. Agency placement based on their specializations
2. The placement will be for a minimum duration of 21 fieldwork days for two days per week/semester.
3. Importance to be given for the practice of social work methods.

Each student is expected to conduct case work with a minimum of three clients, group work with at least two groups, and organise one institutional/ community-based programme(trainees of all specialisations).

Guidelines for Medical and Psychiatric Social Work Specialization

1. Practice of Social Case Work with at least five clients
2. Exposure to Medical and Psychiatric Settings
3. Practice of Social Group Work with at least two groups
4. One Community based programme.

Guidelines for Family and Child Welfare Specialization

1. Practice of Social Case Work with at least five clients
2. Exposure to family and child welfare programmes
3. Practice of social group work with at least two groups
4. One community based programme.

Guidelines for Human Resource Management Specialization

1. Exposure to welfare measures and programmes in industries.
2. Orientation to IR activities/Trade Union and case laws on labour legislations
3. Understanding of Organisation profile/Organisational Culture.
4. One Career Guidance Programme

Guidelines for Community Development Specialization

1. Exposure to DRDA/Panchayat Union and Panchayat administration
2. Orientation to community based surveys/PRA
3. Organise at least two need based community programmes
4. Practice of Social Work methods in Community Settings(Rural/Tribal areas)
5. Knowledge of CD programmes.

Evaluation Internal (40marks)

1.	Case Work Practice	:	10 marks
2.	Group Work	:	10 marks
3.	Awareness Programme	:	10marks
4.	Reporting	:	5 marks
5.	Attendance for fieldwork	:	5 marks

40 marks

External (60 marks)

1.	Theoretical Knowledge	:	20marks
2.	Practice Skills	:	20marks
3.	Agency Evaluation	:	10marks
4.	Communication and Presentation :		10marks

60 Marks

Pedagogy

Case Presentation, Individual conference, Group Conferences, Discussions, Supervision

Coursedesigner Ms.P.Meenakshi.

SEMESTER IV	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PSW4CC5P	BLOCK PLACEMENT	CORE PRACTICUM V	6	5

Course Objectives

1. To expose students to various fields of Social Work Practice.
2. To enable the students to apply theoretical knowledge in their respective field.
3. To enable students to gain professional intervention skills and program/process implementation skills
4. To help the students to develop skills in documentation.
5. To equip students to develop personal and professional self.

Pre –requisites

The learner will get a Practical exposure in various fields of Social Work

Course Outcome

On the Successful completion of this course, the students will be able to

CO Number	CO Statement	Knowledge level
CO1	Categorize various client groups and their problems.	K4
CO2..	Analyse practice skill and integrate learning.	K4
CO3.	Prioritize the immediate problems of the clients	K5
CO4.	Evaluate understanding of reality situations through involvement in day to day work.	K5
CO5.	Adapt to the role of a professional social worker.	K6

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO 5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	2	3	2	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	2
CO4	3	2	2	3	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium)

Correlation – “3” – Substantial (High) Correlation – “-” indicates
there is no correlation.

Syllabus

- The internship must be for a minimum of 30 field work days in an organisation related to the candidate’s specialization.
- Students can adopt integrated social work practice employing appropriate method to work with individuals, group and communities.. Students practice the methods of Social Work complying with the Policies of the agencies of their placement. Learn to write proposal for the projects related to their agencies.
- Students are guided by the agency supervisor regularly and by the staff in charge virtually.
- Students send their day to today reports to their respective staff in charges through electronic media for the effective monitoring of their progression.

Evaluation

1. Internal

Application of Social Work Methods and Skills -20Marks

Reporting - 10Marks

Attendance to field work 10Marks

40 marks

2. **External**

Agency Evaluation

- 30 Marks

VIVA-VOCE

- 30Marks

60 Marks

(**Note:** Common VIVA-VOCE for concurrent field work and Block placement at the end of IV semester)

Pedagogy

Case Conference, Individual conference, Discussions

Course Designer : Dr.R.Anitha

Semester IV	Internal Marks :25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PSW4CCC3A	PSYCHIATRIC SOCIAL WORK	CORE CHOICE	6	4

Course Objectives

- *To introduce the concept of psychiatry& Psychiatric social work
- *To make aware of types of Psychiatric disorders, therapies used in treatment .
- * To teach role & functions of Psychiatric Social Workers in different fields.

Pre requisites

Learners should have a basic knowledge about Mental Illness & its symptoms

Course Outcomes:

On successful completion of the course the students will be able to

CO Number	CO Statement	KNOWLEDGE LEVEL
CO1.	Recall, Explain Outline the concepts of psychiatry Classify psychiatric illness and disorders	K1, K2
CO2.	Examine the origin & development of Psychiatric Social Workers & Skills & qualities of Psychiatric Social Workers.	K3
CO3.	Explain, Examine, Evaluate the therapeutic Interventions of psychiatric Disorders	K4
CO4.	Explain, analyse & apply the roles & functions of Psychiatric Social Worker.	K5
CO5	Application of Social Work methods in Psychiatric Settings.	K6

Mapping of CO with PSO and PO

COs	PSO 1	PSO 2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	2	2	3	2
CO2	3	2	3	3	2	3	3	3	3	3
CO3	3	3	3	3	2	3	2	2	3	3
CO4	3	2	3	3	3	3	3	3	2	3
CO5	3	2	3	2	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” –

Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Psychiatry: concept and definition of Psychiatry, Historical development of Psychiatry, attitudes and beliefs pertaining to mental illness in ancient, medieval and modern times. Psychiatric Social Work: definition and concept, historical development in India and abroad; current status as a field of specialization, Scope of Psychiatric Social Work practice, limitations and difficulties faced in psychiatric social work practice	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Concept of normality, abnormality and mental health; classification of mental illness: Diagnostic Statistical Manual (DSM V) ; International classification of diseases ICD - 11) psychiatric assessment : interviewing ,case history taking, sources of intake, mental status examination; formulation of psychosocial diagnosis.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

III	Organic Disorders, Neurotic and Stress-related disorders : Causes, Signs, Symptoms, and Management of Organic Disorders-Delirium and Dementia; Alcohol and other Substance Use Disorders; Neurotic– Generalized Anxiety Disorder, Panic Disorder, Phobic Anxiety Disorder, Obsessive- compulsive disorder; Stress-related Disorders: Post-traumatic Stress Disorder, Adjustment disorder; Somatoform disorders – Dissociative disorders, Hypochondriacal and Pain disorder. Psychotic Disorders and Adult Psychiatry: Clinical Signs, Symptoms, Causes and Management of Schizophrenia, Mood/Affective Disorders (Bipolar, Depression and Mania), Behavioural syndromes – Personality disorders – Psychosexual Disorders and Deviation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Disorders of Childhood and Adolescence Disorders of Psychological Development: Speech and language disorders, learning disorders, pervasive developmental disorder-Autism, motor-related disorders, Mental Retardation, Cerebral palsy, Behavioral and Emotional disorders of childhood and adolescence - Conduct disorders, Attention Deficit Hyperactive Disorder, Eating disorder, Elimination disorder, sleep disorders.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Therapeutic Interventions in Psychiatric Illness: Psycho education, cognitive therapy, group psychotherapy, family therapy, marital therapy: scope and types; behaviour therapy: principles and techniques, ECT, chemotherapy, psychosurgery and mega vitamin therapy; occupational therapy (purpose and concept). Role and functions of a psychiatric social worker with regards to the problems of patients and their families. community Mental Health -Admission and discharge procedures in a psychiatric Hospital.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	Self study for Enrichment (Not for Examination) Discussion with the Field Experts from your field work experience & prepare a report on intervention techniques (Any two disorders)		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

References:

1. Beck Judith S. Cognitive Behavior Therapy, Basics and Beyond(2011), the Guilford Press New York
2. Bhugra. D, Gopinath.K, Vikram Patel (2005), Hand Book of Psychiatry- A South Asian Perspective. Byword Viva Publishers Pvt Ltd., Mumbai
3. Carson, Robert C., James N. Butcher, and James C. Coleman.. Scott, (1988), Abnormal psychology and modern life Foresman & Co.
4. Daver, Bhargavi, (1999). Mental Health of Indian Women. New Delhi : Sage Publications
5. Daver, Bhargavi, (2001). Mental Health from a Gender Perspective. New Delhi : Sage Publications
6. Dhanda, Amita, (1999). Legal Order and Mental Disorder. New Delhi : Sage Publications
7. Denzin, Norman K. (1987) Treating alcoholism: An alcoholics anonymous approach. Vol. 46. Sage Publications, Inc.,
8. Dickerson, Martha Ufford. (1981) Social work practice with the mentally retarded. Free Press. Hudson, Barbara L., and Raghu N. Gaiind. Current Themes inPsychiatry. Macmillan, (1978). John Wiley & Sons, .
9. Kaplan, (2005). Comprehensive Text Book of Psychotherapy. USA
10. Kapur, Malavika, (1997). Mental Health in Indian Schools. New Delhi : Sage Publications
11. Kraepelin, Emil. (1990) Psychiatry: A Textbook for Students and Physicians. GeneralPsychiatry. Ed.Jacques M. Quen. Science History Publications,.
12. Paul, Gordon L., and Robert J. Lentz. (1977) Psychosocial treatment of chronic mental patients:Milieu versus social-learning programs. Harvard University Press,

13. Ryle Anthony and Kerr Ian B. (2002). Introducing Cognitive Analytic Therapy: Principles and Practice. John Wiley & sons Ltd, Baffins Lane, chichester, England
14. Sadock, B., Kaplan, H. & Sadock, V. (2000). Comprehensive Textbook of Psychiatry. Hagerstwon: Lippincott Williams & Wilkins
15. Sekar,K.,Parthasarathy, R., Muralidhar,D.,Rao,M.C. (2007). Handbook of Psychiatric Social Work(Ed).Bangalore: NIMHANS.
16. Verma, Ratna. (1992) Psychiatric social work in India. SAGE Publications Pvt. Limited,.
17. Walrond-Skinner, Sue, ed. (1981).Developments in family therapy: Theories and applications since1948. Routledge.
18. WHO, (1991) Innovative Approaches in Mental Health Care, Psychosocial Interventions and Care Management, Geneva

Web Resources:

[Microsoft Word - bluebook.doc \(who.int\)](#)

[Psychiatric Social Work \(PSW\) | PDF \(slideshare.net\)](#)

[Psychiatric Disorders: Common Types and Symptoms \(verywellmind.com\)](#)

[Microsoft PowerPoint - Role of psyciatric social worker in in-patient setting \(mgkvp.ac.in\)](#)

https://www.youtube.com/watch?v=K2sc_ck5BZU

<https://www.youtube.com/watch?v=5Dh87gXEs68>

<https://www.youtube.com/watch?v=Lk4qs8jGN4U>

Pedagogy

Lectures, Group discussion, PPT presentation, Case study and seminars.

Course Designer : Ms.PL.Rani

Semester IV	Internal Marks :25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/ Week	CREDITS
22PSW4CCC3B	WELFARE OF THE YOUTH AND AGED	CORE CHOICE	6	4

Course Objectives

1. To make the students to understand the profile of youth in the contemporary Indian society
2. To help the students aware of youth movements.
3. To orient the students on the welfare services meant for youth in India.
4. To sensitize the students about the position of older persons in the Indian Society.
5. To facilitate students' understanding on the welfare measures meant for older persons in India.

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	KNOWLEDGE LEVEL
CO1.	Define the concepts and problems of youth	K2
CO2.	Illustrate youth movement in India & youth welfare.	K2
CO3.	Identify the problems involving in the process of ageing.	K3
CO4.	Discuss the issues of aged	K4
CO5	Evaluate the programs and services for aged and analyse the new strategies and plans for Social Work with Aged	K5,K6

Mapping of CO with PSO and PO

COs	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” –

Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Youth: Concept, demographic profile of rural and urban youth; Youth bulge; process of socialisation of Indian youth; Youth in New Millennium: Challenges and Opportunities; Youth in the context of globalization: Youth power, social capital; Education and Skill Development and Entrepreneurship; social media and digital divide; Youth not in employment, education or training (NEET).	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
II	Youth Movement in India: YMCA, YWCA, SFI, DYFI and other youth movements of various political parties in India., Youth unrest. National Youth Policy (2014); Youth work: concept, objectives, training programmes for youth in tribal, rural and urban areas.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

III	Welfare Services for student youth: education, physical education, sports, recreation, vocational guidance, youth services, Bharath Scouts and Guides, National Services Scheme, National Cadet Corps, youth festivals and youth camp, student Counselling; Needs and services for non-student youth: Non-formal education for school drop outs; NYK & VYK; Youth welfare programmes under government and voluntary agencies.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
IV	Aged: Definition, types, Demographic profile of aging population in rural and urban India. Gerontology: Theories of aging; dimensions of aging; changing status of the aged in Indian society; problems of the aged- health, family, social relation and employment; perspective on the population of aging in India; retirement as a social and economic event.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
V	Services for the aged: Geriatric services in India; family social work with the aged; social welfare services for the aged; old age social security measures in India and other countries; Rehabilitation and community linkage programme; national and international agencies for aged welfare & policies.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
VI	Self-study for Enrichment (Not to be included for End Semester Examinations) Visit a youth club and write report on their activities. Conduct a mini research study on quality of life among Elderly.	-	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

Text Book:

Nair, P. S et al.(1989). Indian Youth: A Profile. Mittal Publications

Reference Books

1. Buvaneswari, Mettilda.G.(2010). Social Gerontology-A training Manual, Agasthiar Publications.
2. Durgadutt,M.V.(1993). *Youth Culture: A Comparative Study in the Indian Context*. South Asia Books.
3. Jones Gill, (2009).*Youth*.Polity Press, UK
4. Kehily Jane Mary (Etd.) (2007).*Understanding Youth: Perspectives, Identities and Practices*.Sage Publication, London
5. Kumar, R.(1986). *Problems, Planning and Development of Youth Health* .Deep and Deep.
6. Muttagi, P. K..(1997). *Aging issues and old age care*. Classical Publishing Company.
7. Peter Ronald D’Souza (2009). *Indian Youth in a transforming world*. SAGE Publication, New Delhi
8. Stephen Hamilton (2004). *The Youth Development Handbook*. SAGE Publication, New Delhi
9. Wood Jason and Hine Jean (2009).*Theory and Policy for Practice*. Sage Publications New Delhi.

Web References

https://mospi.gov.in/sites/default/files/publication_reports/Youth_in_India_2022.pdf

https://library.columbia.edu/content/dam/libraryweb/locations/burke/fa/mrl/ldpd_9504325.pdf

https://mis.alagappauniversity.ac.in/siteAdmin/dde-admin/uploads/3/PG_M.S.W. Socialogy_34934D%20-%20WELFARE%20OF%20THE%20YOUTH%20AND%20THE%20AGED.pdf

<http://pop10.com/in/pdf/ageinginindia.pdf>

<https://bbau.ac.in/Docs/FoundationCourse/TM/MPDC405/Government%20Schemes%20for%20Senior%20Citizens.pdf>

https://www.youtube.com/channel/UCYeBoQSDrN0xb_QoibDsG_A

<https://www.youtube.com/watch?v=fYBC-vc5T8I>

Pedagogy

Lectures, Audios / Videos followed by discussion, PPT, and Student-led seminars.

Course Designer

Dr.G.Mettilda Buvaneswari

SEMESTER IV	INTERNAL MARKS:25		EXTERNAL MARKS :75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22PSW4CCC3C	ORGANISATIONAL BEHAVIOUR	CORE CHOICE COURSE	6	4

Course Objectives

- To know the basic concept of Organisational Behaviour
- To understand the techniques of Organisational Development
- To analyse the Modern Management Practices in Industry

Pre-requisites

The learners need to have a basic understanding on Organisational behaviour to handle the people's behaviour in the organisation.

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	COGNITIVE LEVEL
CO1	Explain and apply the concept of organizational Behaviour and how the Individual Behaviour influenced by Personality, learning, attitude and Perception, Motivation and Leadership	K1, K2,K3
CO2	Interpret,Identify and Analyse the group behaviour in the organization and Conflict resolution Strategies	K2,K3,K4
CO3	Explain,Examine and Evaluate the dynamics of organization behaviour in the aspect of Culture, Climate and Conflicts and Organisational Development	K2, K4,K5,K6
CO4	Analyse and Assess the various techniques in practices of Organizational Development and trends in OB Practices	K4,K5
CO5	Explain and adapt to OB Practices	K5,K6

Mapping of CO with PSO and PO

Cos	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High)Correlation– “-” indicates there is no correlation

Mapping of CO with PSO and PO

Cos	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation – “2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Organizational Behaviour: Brief History-Evolution, Concept-Contributions of the Behavioural Sciences – Models. Personality–Types– Factors and theories; Learning: Learning process and Theories. Attitude: characteristics– components – formation; Perception: Importance – Factors influencing perception- Decision Making – Meaning and Techniques, Motivation– Meaning, Importance – Theories.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Group Behaviour: Meaning and Nature of groups– Groups in Organisations – Stages of Team Development, Determinants of Group Behaviour, Leadership – Meaning – Importance – Leadership styles – Theories–Power and Politics, Stress, Organizational Conflict: Concepts, Causes and Types, Conflict-resolution strategies	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

III	Dynamics of Organisational Behaviour: Concept of Organisational Culture and Organizational Climate – Factors affecting Organisational climate, Organisational Culture: Definition, Creating and Sustaining, Organisational Change: Definition, Change Resistance , Planned Changes and Approaches to Manage Change.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Organizational Development: Concept, Definition, Theory, Stages and Practice, OD Intervention Techniques: Sensitivity Training, Johari Window, SWOT , Transactional Analysis Grid Training, Survey Feedback, Third party Intervention, Management by Objective and Team management	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Current Trends in OB Practices: Just-in-Time(JIT)- 5S model-TPM-TQM-Kaizen-ISO-SEI. Computer Applications in OB practice: Concepts MIS ,SAP and People soft.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-study for Enrichment (Not to be included for End Semester Examinations) Organisational effectiveness – Perspectives and Application of Transactional Analysis and Johari Window, Kinesics.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Books for References

- Aswathappa.K. (2010). Organisational Behaviour.Himalaya Publishing House PvtLtd.
- Baron, Robert A. and Greenberg Jerald. (2008) Behavior inorganizations. New Jersey: Pearson India Education Services PvtLtd.
- Robbins, Stephen P.and Tim.Judge (2019). Essentials of Organization Behaviour. PearsonIndia Education Services PvtLtd.
- Newstrom, J.W. (2014) Organizational Behaviour: Human Behavior at Work. McGraw-Hill Publications Ltd
- Khanka S. S. (2000). Organisational Behaviour.S.Chand Publications PvtLtd.
- Fred Luthans, (2000). Organizational Behaviour. Singapore: McGraw HillLtd.
- Prasad L.M. (2014). Organisational Behaviour .Sultan Chand & Sons Publications PvtLtd.
- Inder Jeet and Suman Solanki. (2017).Organisational Behaviour (CBCS).Taxmann Publication PvtLtd.

Online Resources

- <https://www.youtube.com/watch?v=24V6Xl1xWKE>
- <https://www.youtube.com/watch?v=Y1kVN-m9y7U>
- <https://www.wallstreetmojo.com/kaizen/>

Pedagogy

Chalk& Talk, lecture, Seminar, E Content, E Quiz, Group Discussion and Case Study.

Course Designer

Ms.S.Hema

SEMESTER IV	INTERNAL MARKS :25		EXTERNAL MARKS : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22PSW4CCC3D	DEVELOPMENT PLANNING, POLICY AND PRACTICE	CORE CHOICE	6	4

Course Objectives

- To know the concept of development
- To analyze the applicability of policies
- To know the importance of planning
- To analyze the role of planning in development

Pre-requisites

The learners need to have a basic understanding on development planning and policies

Course out come

On successful completion of the course the students will be able to:

CO Number	CO Statement	Knowledge Level
CO1	Describe the conceptual understanding of Development	K1
CO2	Discuss on needs of Policy Analyst, Planners and Practitioners in understanding the intricacies and processes of policy making.	K4
CO3	Classify the need and importance of multi-level planning and implementation	K4
CO4	Develop students with integrated policy making, planning and practice related skills.	K6
CO5	Evaluate experiences and contextualize the learning of India in a student perspective	K5

Mapping of CO with PSO and PO

Cos	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	3	3	3	3
CO2	3	3	2	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	2	3	3	3	2

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	FOUNDATIONS AND PERSPECTIVES OF DEVELOPMENT Development –Concept, Features, Theory, Approaches, India’s Development experience. Basic concepts: Political Economy, State, Democracy and Polity. Decentralized Governance and Planning: Concept and features.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	DEVELOPMENT PLANNING Development Planning –Definitions of Town and Country Planning, Concept& Features, Micro Level planning at the Local, Town, City, and District. Sustainability and rationality in planning, components of Sustainable urban and regional development. Marginalization and Concepts of inclusive planning Challenges & International Perspective of Development Planning.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

III	DEVELOPMENT POLICY & PRACTICE Development Policy& Practice – Concept & Features, Process of Policy making, Development Policies related to agriculture, industry, employment, welfare & environment. Rural Habitat policy- experiences in developing Countries regarding Settlement structure, growth and its spatial distribution	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	RURAL & ECONOMIC DEVELOPMENT POLICIES IN INDIA Rural Development Policies: History, Concept& its types - Land &Agricultural Policy, Health Policy, Employment Policy and Rural Institutions Policy. Economic Development Policies: History, Concept, Origin& its types - Industrial Policy, Trade Policy, Monetary Policy, Fiscal Policy and International Trade Policy, Frame work for Policy Analysis	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	SKILLS & TOOLS FOR DEVELOPMENT PLANNING, POLICY AND PRACTICE Skills required: Analyzing and interpreting data and situations, diagnosing problems and identifying relevant causal factors, Predicting and forecasting, Goal setting and identifying possible courses of action, Evaluating and comparing possible courses of action, Communicating and Implementing actions and monitoring them. Tools: Participatory planning, Stakeholder identification, Problem Tree analysis, Strategy development, Community Action Plan (CAP), Logical Framework Approach (LFA), Project proposal writing and implementation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	Self-study for Enrichment (Not to be included for End Semester Examinations) Discussion of Case studies on the implications of Rural and Economic Development Policies on its masses. Visiting an NGO working in Rural setting and understanding Micro level planning – process, advantages and disadvantages.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

TEXTBOOK

1. Saeed, K. (2016). Development Planning and Policy Design: A System Dynamics Approach (Kindle Edition)

REFERENCES:

1. Kulshrestha (2012). Urban and Regional Planning in India: A Handbook for Professional Practice, SAGE India; First edition
2. Nath, V (2010). Economic Development and Planning in India Hardcover. Concept Publishing & Co.
3. Dale, R. (2004). Development Planning: Concepts and Tools for Planners, Managers and Facilitators, ZED Publishers.
4. Sukhamoy, C (1998). Development Planning: The Indian Experience, OUP India Publisher.

WEB SOURCES:

1. https://www.orfonline.org/wp-content/uploads/2018/07/70_Policies.pdf
2. <https://www.jnu.ac.in/sites/default/files/u63/12A%20Review%20of%20Urban%20%28Lalit%20Batra%29.pdf>
3. <http://www.economicdiscussion.net/economic-policies/economic-policies-top10-economic-policies-followed-in-india/9914>
4. http://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000032SW/P001729/M021647/ET/15_01588996Module-25_e-Text.pdf

Pedagogy: Seminar, PPT Presentation, Brain storming, Group Discussion and Case Study.

Course Designers: Dr G.Kanaga

Semester IV	Internal Marks :25		External Marks : 75	
Course Code	Course Title	Category	Hours/Week	Credits
22PSW4GEC2	Women Development	Generic Elective Course II (GEC)	3	2

Course Objectives

- To know the development process among women
- To discuss about role of education in Women Development
- To learn the policies and programmes for women

Pre-requisites

The learners have a basic knowledge on Women

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	COGNITIVE LEVEL
CO1	Define and explain about women development and women empowerment	K1,K2
CO2	Summarise the status of women and examine the national machinery for Women development	K2,K3
CO3	Classify and analyse International Agencies for Women's Development	K3,K4
CO4	Examine the role of women development in decision making- Leadership, education, economic and political fields	K4
CO5	Judge the effectiveness of important laws for women	K5

Mapping of CO with PSO and PO

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation – “2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Status of Women Concept of development with reference to women, Women in development, women and development, women empowerment: meaning, and characteristics of empowered women, Feminism and its types, Women's movements, The International Women's Year.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Role of Women in Development Women in developing countries with special reference to India, Women's Leadership, Political participation of women, Women in Labour force, Women's Education, Women and Sustainable development Goals.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Important laws for Women Development Dowry prohibition Act -1961, Domestic violence act-2005, The Prohibition of Child Marriage Act-2006, The Pre-Conception & Pre-Natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act- 1994, The Sexual Harassment of Women at Work Place (Prevention, Protection and) Act-2013.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	National Machinery for Women's development Ministry of Women and Child Development, National Commission for Women, Central Social Welfare Board (CSWB), National Institute of Public Co-operation and Child Development (NIPCCD), Rashtriya Mahila Kosh (RMK)	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	International Agencies for Women's Development UNFPA, UNICEF, UNIFEM, FORD Foundation, UNDP, UNWOMEN	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-study for Enrichment (Not included for End Semester Examinations) Learners can prepare an e content on important laws related to women	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book:

1. Das Gupta Monica & Krishnan T.N. (1998). Women and Health. Delhi: Oxford.

2.Sittirak S. (1998). The Daughters of Development: Women and the Changing Environment, 261 pp. London: Zed Books.

Reference Books

- Agrawal, S.P (2001), Women's Education in India, Guwahati, Eastern Book House.
- Andal, N (2002), Women and Indian Society: Options and Constraints, Guwahati, DVS Publishers
- Bakshi, S.R. (2002), Empowerment of Women and Politics of Reservation, Guwahati, DVS Publishers
- Gupta Mukta (2000), Women and Educational Development, Guwahati, DVS Publishers.
- Reddy, P. R., and R. Sumangla. (1998). Women in development. New Delhi: Publishing Corporation.

Web Resources

https://www.developmenteducation.ie/media/documents/women_gender_dev.pdf

<https://www.eolss.net/sample-chapters/c14/E1-37-04-03.pdf>

Pedagogy: Lectures, Audios / Videos followed by group discussion, PPT, and Student-led seminars.

Course Designer: Dr.O.Aisha Manju

SEMESTER IV	Internal & External: Total Marks : 100			
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PSW4PW	RESEARCH PROJECT WORK	Research Project	9	5

Course Objectives

- 1.To orient the students to field research.
2. To develop their skills in research problem formulation and research field / area identification.
3. To train them in developing tool of data collection.
4. To introduce and to provide hands on training to the students on the various sampling procedures.
5. To impart data collection skills.
6. To develop their ability to analyse the data they have collected.
7. To develop their scientific writing.
8. To enable them in preparing research reports.

Pre –requisites

The learner will get a Practical exposure in fields of Social Work research

Course Outcome

On the Successful completion of this course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1.	Summarize the social problems to be studied	K2
CO2.	Interpret literature Pertaining to the study	K3
CO3.	Examine Research Proposal	K4
CO4.	Evaluate findings of the study	K5
CO5	Formulate solutions and recommend for policy making.	K6

Mapping of CO with PSO and PO

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	2	2	2
CO2	3	3	3	3	3	2	2	2	2	2
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	3	3	2	2	2	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1” Slight (LOW) Correlation –“2” Moderate (Medium) Correlation 3”-Substantial (High) Correlation–“-“ Indicates there is no correlation

Every student in the IV Semester will complete a research project under the supervision and guidance of a faculty member on topics related to social issues and Social Work Practice. A minimum of 75 pages including Bibliography is mandatory and not exceeding 100 pages.

1. PROJECT REPORT EVALUATION (Both Internal & External)

S.No	Particulars	Marks
1	Plan of the Project	20
2	Selection and formulation of research problem, significance of the problem, Execution of the Plan, preparation of tools of data collection /Collection of Data/Organisation of Materials/Hypothesis Testing etc and Presentation of the Report	45
3	Research contribution	15
4	Viva Voce/Internal & External	20
	Total	100

Pedagogy : Discussions, assessment of questionnaires/Inventories etc.

Course Designer : Dr.G.Mettilda Buvaneswari

ANNEXURE E



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited (III cycle) with 'A' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF BUSINESS ADMINISTRATION



BBA

SYLLABUS

2023 -2024 and Onwards



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18

DEPARTMENT OF BUSINESS ADMINISTRATION

BBA

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the candidates admitted from the academic year 2023 – 2024 onwards)

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	

II	I	Language Course - II (LC)	Pothutamil - II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar - II	22ULH2						
			Prose Grammar and History of Sanskrit Literature	23ULS2						
			Basic French – II	22ULF2						
	II	English Language Course – II (ELC)	General English - II	23UE2	6	3	3	25	75	100
	III	Core Course - III (CC)	Elements of Marketing	23UBA2CC3	6	5	3	25	75	100
		Core Course – IV (CC)	Business Statistics	23UBA2CC4	5	5	3	25	75	100
		Allied Course - II (AC)	Business Environment	23UBA2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course- II (AECC)	Environmental Studies	23UGEVS	2	2	-	100	-	100
	V	Extra Credit Course	SWAYAM		As per UGC Recommendation					
		Total			30	21				600

CORE COURSE III (CC) – ELEMENTS OF MARKETING
2023 – 2024 Batch Onwards

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
23UBA2CC3	ELEMENTS OF MARKETING	CORE	6	5

Course Objectives:

- To acquaint the students with the functions and segmentations of market environment.
- To enable the students, understand the development of new product upcoming in the market.
- To upgrade the students regarding the various emerging markets in adynamic market environment.

Pre-Requisites: Basic Knowledge in Marketing.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Understand and acquire marketing concepts and functions of Marketing.	K1
CO2	Classify and understand the various approaches to segmentation and buyer behaviour, decision process.	K2
CO3	Identify the need of new product development and pricing objectives, importance and methods.	K2
CO4	Estimate the various classification of advertising and selling and apply the knowledge as a tool for promotion.	K3
CO5	Apply the Knowledge for recent trends in marketing.	K3

MAPPING OF CO WITH PO AND PSO :

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	2	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	1	3	1	3	3	3	1	3

“1”-Slight(Low) Correlation-“2”- Moderate (Medium) Correlation-

“3”- Substantial (High) Correlation –“-“ indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Marketing – Definition - Scope and importance of Marketing - Functions of marketing – Marketing Mix - Classification of Markets.	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Market Segmentation – Approaches to Segmentation – Factors influencing buyer behavior – Buying Decision Process.	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Product life cycle – New product development process –Product Mix– Pricing objectives and importance – Factors influencing price – Pricing methods.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Promotion Mix – Elements – Advertising – Classification of Advertising – Advertising media – Types of media – Sales Promotion and Personal selling.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Recent trends in marketing – Social media marketing – Online marketing – Telemarketing – Green marketing - Marketing Information System.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Role and Functions of Marketing Manager- Product Positioning - Product mix - Strength and Weakness of Personal selling – Basic Concepts of Niche Marketing & Guerrilla Marketing.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Rajan Nair.(2015), *Marketing*, Sultan Chand & Sons.
2. Pillai & Bhagavathi, (2016), *Modern Marketing*, 5th Edition, S. Chand & Company.

Books for Reference:

1. Philip Kotler, (2001), *A Framework for Marketing Management*, 1st Edition, Prentice Hall of India.
2. Rajan Saxena, (2005), *Marketing Management*, 3rd Edition, Tata McGraw Hill Publishers.
3. Sherlekhar, *Marketing Management*, 14th Edition, Himalaya Publishing House Pvt. Ltd,
4. Varshney R.L and Gupta S.L, (2016), *Marketing Management Text & Cases*, 3rd Edition, Sultan Chand & Sons.

Web Resources:

1. <https://www.tutorialspoint.com>
2. <https://www.yieldify.com> .
3. <https://www.uschamber.com>
4. <https://edynamiclearning.com>

Pedagogy: Lecture, Power Point Presentation, Assignment, Seminar.

Course Designer: Ms. P. THANGAMANI, Assistant Professor.

CORE COURSE IV (CC) - BUSINESS STATISTICS

2023 – 2024 Batch Onwards

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
23UBA2CC4	BUSINESS STATISTICS	CORE	5	5

Course Objectives:

- To equip the students to solve problems statistically.
- To promote the students to analyze management problems in research and decision making.
- To understand the basic knowledge on graphical representation.

Pre-Requisites: Basic Knowledge in Statistics.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Examine the basics of Statistics in Business and Analyze the data – Graphs and Diagrams.	K1
CO2	Analyze the data – Graphs and Diagrams.	K2
CO3	Estimating the measures of central tendency – Mean, Median, Mode.	K2
CO4	Acquire the conceptual knowledge of measures of dispersion.	K2
CO5	Apply and practice of the simple correlation and Regression analysis	K3

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	2	3	3	3	3	2	3
CO5	3	3	1	2	1	3	3	1	2	1

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Introduction to statistics – Definition – Nature – objectives - Scope – Uses and limitations of statistics in Business- Data - Sources of data – collection of data - Frequency distribution - Data grouping - classification and tabulation.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Introduction to Graphs - Diagrammatic representation- One, Two and Three dimensional Diagrams; Bar diagram: Introduction - Simple bar diagram and Multiple bar diagram, Percentage bar diagram - Pie diagram – Graphic representations – Histogram, Frequency polygon and frequency curve, Ogives.	17	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Measures of central tendency – Mean, Median, Mode - Weighted Arithmetic mean - Geometric mean and Harmonic mean – Uses and limitations of measures of central tendency – Skewness and kurtosis.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Measures of Dispersion – Range - Co-efficient of Range – Quartiles - Inter-Quartile Range and Quartile Deviation - Coefficient of Quartile Deviation - Mean Deviation - Coefficient of Mean Deviation - Standard Deviation.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Correlation – Definition – Correlation analysis – Types of Correlation - Karl Pearson's Coefficient of correlation and Spearman's Rank correlation – Uses of Correlation Analysis - Regression Analysis.	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Statistics as a Subject of Study - Data and Information - Statistical variables: Qualitative and Quantitative - Sampling: population and samples - Parameter and Statistics - Sampling methods - Random Sampling and Non – Random Sampling. Lorenz curve, Combined mean and Standard deviations.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

- 1 .Dr. S P Gupta,(2021), *Statistical Methods*, 46th Edition, Sultan Chand Publications.

Books for Reference:

1. S.P.Gupta & M.P.Gupta, (2013), *Business Statistics*, 6th Edition, Himalaya Publishing House.
2. R.S.N.Pillai & Bagavathi, (2010), *Statistics*, 7th Edition, Sultan Chand and Sons.
3. M.C. Shukla & S. C.Gulshan, (2010), *Statistics – Theory and Practice*, 6th Edition, Sultan Chand and Sons.

Web Resources:

- 1 <https://www.geeksforgeeks.org/introduction-of-statistics-and-its-types/>
- 2 <https://flexbooks.ck12.org>
3. <https://statistics.laerd.com/statistical-guides>

Pedagogy: Lecture, Power Point Presentation, Assignment, Seminar.

Course Designer: Dr.S.THAMARAISELVI, Associate Professor.

ALLIED COURSE II (AC) - BUSINESS ENVIRONMENT**2023 – 2024 Batch Onwards**

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
23UBA2AC2	BUSINESS ENVIRONMENT	ALLIED	5	3

Course Objectives:

- To Identifying business opportunities.
- To promote basic understanding of the concept of Business Environment.
- To make learners the impact of environment on business.
- To learn Macro and Micro Economic Environment in Business.

Pre-Requisites: Basic Knowledge in Business Environment.**Course Outcomes:**

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Enable the students to acquire basic ideas about Business environment and its components	K1, K2
CO2	The students will be able to demonstrate and develop conceptual framework of business environment and generate interest in business	K2
CO3	Students will have a fair understanding of the Business	K2
CO4	Students will know the concept of business environment and factors influencing the environment	K2
CO5	Students will get to learn the latest trends in the Business	K3

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	1	3	3	2	3	2
CO2	2	3	3	3	3	3	1	2	2	3
CO3	3	1	2	2	2	3	2	3	3	2
CO4	3	2	2	3	3	1	3	3	3	2
CO5	2	2	2	3	3	2	3	2	2	1

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Business – Meaning – Objectives – Scope - Nature and Characteristics of Business. Business Environment - Types of Environments – Internal – External - Micro and Macro Environment. Process and limitations of Environmental Analysis.	8	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Economic Environment: Meaning of Economic Environment- Nature, factors affecting Economic Environment - Basic Economic System – Capitalism - Mixed Economy - Socialist Economy. Liberalization – Privatization - Globalization (LPG) – Nature and Objectives.	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Political Environment: Political Environment - Meaning, Importance of Political Environment - Responsibilities of Business towards Government - Role of Political Environment in Business - Political Systems - Political Intervention and Participatory role.	8	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Socio-Cultural Environment: Nature and impact of Culture on Business - Peoples attitude to Business and Work - Business and Society - Social Responsibility of Business - CSR - Arguments for and against social responsibility of Business.	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Technological Environment: Concept, Significance, features and types of Technological Environment - Impact of Technology on Business – Globalization - Nature, Advantages and disadvantages - Transfer of Technology - Status of Technology in India.	9	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Factors affecting Business Environment-Economic environment in India – Challenges in Political Environment – Importance of CSR -. Sources of Technological Dynamics - Innovation.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. K.Aswathappa (2014) – *Essentials of Business Environment* –13th Edition Himalaya Publishing House.
2. VeenaLeshavPailwar (2012) – *Economic Environment of Business* –3rd Edition Prentice Hall Learning Pvt Ltd.

Books for Reference:

1. Rangarajan, C.A.; *Perspective in Economics*, S.Chand & Sons, New Delhi
2. Cherunilam, Francis; *Business Environment - Text and Cases*, Himalaya Publishing House.
3. Shaikh Saleem *Business Environment*, 2nd Edition, Pearson Publications.
4. P.K. Ghosh, *Business Environment*, Sultan Chand & sons.

Web Resources:

1. <https://www.studocu.com/in/document/university-of-kerala/business-environment/introduction-definit>.
2. <https://www.vedantu.com/commerce/economic-environment>
3. <https://www.mbaskool.com/business-concepts/marketing-and-strategy-terms/2515-political-environme>

Pedagogy: Lecture, Power Point Presentation, Assignment, Seminar.

Course Designer: Ms. A. SUGANYA, Assistant Professor.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited (III cycle) with 'A' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF BUSINESS ADMINISTRATION



BBA

SYLLABUS

2022 -2023 and Onwards



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF BUSINESS ADMINISTRATION
BBA

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the candidates admitted from the academic year 2022 – 2023 onwards)

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
IV	I	Language Course - IV (LC)	Pandaiya Elakkiyamum, Urainadaiyum	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French – II	22ULF4						
	II	English Language Course-IV (ELC)	Learning Grammar Through Literature - II	22UE4	6	3	3	25	75	100
	III	Core Course - VI (CC)	Cost Accounting	22UBA4CC6	5	5	3	25	75	100
		Core Practical - II (CP)	Computer Applications Package for Managers -Tally (P)	22UBA4CC2P	5	5	3	40	60	100
		Allied Course - IV (AC)	Company Law	22UBA4AC4	4	3	3	25	75	100
			Internship	22UBA4INT	-	2	-	-	-	100
	IV	Generic Elective Course– (GE) II	Export Management	22UBA4GEC2	2	2	3	25	75	100
			Basic Tamil -II	22ULC4BT2						
			Special Tamil - II	22ULC4ST2						
	IV	Skill Enhancement Course – I(SEC)	Stress Management	22UBA4SEC1	2	2	3	25	75	100
	V	Extra Credit Course	SWAYAM		As per UGC Recommendation					
		Total			30	25				800

CORE COURSE VI (CC) – COST ACCOUNTING
2022 – 2023 Batch Onwards

Semester IV	Internal Marks 25	External Marks 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UBA4CC6	COST ACCOUNTING	CORE	5	5

Course Objectives:

- To facilitate students to understand and to gain knowledge about the concepts and principles of cost accounting
- To apply the costing techniques in various practical situation.

Pre-Requisite: Basic knowledge required in Accounting concepts.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
CO1	Impart the knowledge of basic Cost Concepts, elements of cost and preparation of Cost sheet.	K1
CO2	Formulate stores ledger using FIFO, LIFO, Simple Average and Weighted Average Method as tool of material control	K3
CO3	Compute cost of labour using time and differential piece rate system as a tool of labour control	K2
CO4	Design statement showing allocation and apportionment of overhead of service Department to producing department by using various methods	K3
CO5	Analyze the various types of costing	K4

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	2	3	3
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	3	2	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Cost accounting – Meaning – Objectives and Scope of Cost accounting – Cost concepts – Cost accounting Vs Financial and Management accounting – Advantages of Cost accounting – Limitations of Cost accounting – Types of Costing - Elements of Cost – Preparation of Cost sheet.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	Material Control –Meaning and Objectives – Purchase of Materials – Stock Levels of Materials – EOQ – Stores Records – ABC Analysis – Issue of Materials – Methods of Issue – FIFO – LIFO– Simple average – Weighted average method.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	Labour cost – Types and Labour Turnover – methods of measuring Labour Turnover – Ideal time – methods of wage payment – Time rate system – Piece rate system – Premium and Bonus plans – Halsey Plan - Rowan plan – Taylor’s and Merricks differential piece rate – Gantt’s task bonus plan – Emerson’s efficiency plan.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	Overhead – Definition – Classification – Allocation and Apportionment of Overhead – Primary and Secondary apportionment of overheads – Step ladder methods – Reciprocal methods – Machine hour rate – Computation of Machine Hour Rate.	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	Operating costing – Job costing – Features of Job costing– Objectives of Job costing – Process costing – Advantages of Process costing and Disadvantages of Process costing – computation of process costing – normal loss – abnormal loss – abnormal gain .	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Classification of cost - Cost control and Cost Audit - inventory system – Absorption of Overhead – Selling and Distribution overhead – Contract costing – Standard and variance costing.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

Text Book:

1. Jain S P and Narang K L, (2014), *Cost Accounting Principles and Practice*, Kalyani publishers, New Delhi.
2. Maheshwari S N (2015), *Cost Accounting*, Sultan Chand and Sons, New Delhi.
3. Iyengar S P, (2014), *Cost Accounting*, Sultan Chand and Sons, New Delhi.
4. Reddy T S & Hari Prasad Reddy, (2014), *Cost Accounting*, Margham Publications, Chennai.
5. Shukla Grewal, (2023), *Cost Accounting Text and Problems*, Sultan Chand and Sons, New Delhi.

Books for Reference:

1. Pillai R S N & Bagawathi, (2015), *Cost Accounting*, Sultan Chand and Sons, New Delhi.
2. Jawahar Lal, Seema Srivastava, Manisha Singh, (2019), *Cost Accounting : Text, Problems and Cases*, 6th Edition, McGrawHill.
3. MN Arora, (2021), *Cost Accounting Principles and Practice*, 13th Edition, Vikas Publishing.
4. M.L. Agarwal, (2021), *Cost Accounting*, Revised Edition, Sahitya Bhawan Publications.
5. M.P. Gupta (2008), *Cost Accounting: Text and Problems*, S.Chand Publishing.

Web Resources:

1. https://icmai.in/upload/Students/Syllabus2022/Inter_Stdy_Mtrl/P8.pdf
2. <https://gacbe.ac.in/pdf/ematerial/18BCO51C-U1.pdf>
3. <https://umeschandracollege.ac.in/pdf/study-material/accountancy/Overhead-Costing.pdf>
4. [https://www.srcc.edu/sites/default/files/Process%20Costing%20\(1\).pdf](https://www.srcc.edu/sites/default/files/Process%20Costing%20(1).pdf)
5. <https://edurev.in/t/168325/Job-Order-Costing>

Pedagogy: Lectures, Quiz and Assignments

Course Designer: DR. A. SIVARANJANI, Associate Professor

**CORE PRACTICAL II (CP) - COMPUTER APPLICATION PACKAGE FOR MANAGERS -
TALLY (P)
2022 – 2023 Batch Onwards**

Semester IV	Internal Marks 40	External Marks 60		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UBA4CC2P	COMPUTER APPLICATIONS PACKAGE FOR MANAGERS - TALLY (P)	CORE PRACTICAL	5	5

Course Objectives:

- To impart the basics required for systems accounting in the technological world.
- To prepare various reports using accounting package required for modern business era.

Pre-Requisite: Basic knowledge required in computer.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
CO1	Create company, groups and ledgers using Tally.	K1
CO2	Create different types of voucher.	K2
CO3	Create different stock categories, stock item and stock group.	K3
CO4	Create cost centres and prepare reports such as Day books and Final accounts.	K3
CO5	Creating Company with GST and Budgets.	K3

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS:

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Creation of Company – Creation of Groups - Editing and deleting groups - Creation of Ledgers – Editing and deleting ledgers.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	Introduction to Voucher Entries – Payment Voucher - Receipt Voucher – Sales Voucher – Purchase Voucher - Contra voucher - Journal Voucher- Editing and deleting voucher.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	Introduction to Inventories – Creation of Stock Categories – Stock groups – Stock items – Configuration and features of stock item – Editing and deleting stocks.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	Introduction to cost – Creation of cost categories – creation of cost centers – Editing and deleting-usage of cost category and cost centers in voucher entry – Day book - Trial Balance - Final Accounts – Trading and Profit and Loss A/c – Balance Sheet - Generating reports.	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	Introduction to GST – Registration – Creating Company with GST – Creating Tax Ledgers Recording GST Sales - Creation of Budgets.	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Basic concepts of Accounting – History of Tally - Types of vouchers – benefits of inventory – Kinds of Day books – Basic concepts of GST.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

Text Book:

1. Rizwan Ahmed P,(2019), *Computer Application in Business and Management*, Margham Publications.
2. Ashok K. Nadhani, (2018), *Tally 9.0*, BPB Publications.

Books for Reference:

1. Sinha P K, (2017), *Computer Fundamentals*, BPB Publications.
2. Nanthini K.K, (2018), *Implementing Tally 9.0*, BPB Publications.

Web Resources:

1. <https://www.microsoft.com/en-us/microsoft-365/blog/>
2. <https://www.tutorialkart.com/tally/tally-tutorial/>
3. <https://byjus.com/govt-exams/microsoft-word/>
4. <https://edu.gcfglobal.org/en/google-forms/>

Pedagogy: Lectures, Power Point Presentation, Assignment, Seminar, Computer Practical.

Course Designer: Dr. M. NEELA, Associate Professor.

ALLIED COURSE IV (AC) - COMPANY LAW**2022 – 2023 Batch Onwards**

Semester IV	Internal Marks 25	External Marks 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UBA4AC4	COMPANY LAW	ALLIED COURSE	4	3

Course Objectives:

- To promote basic understanding of the concept of Company Law
- To impart knowledge about establishing and conducting affairs of the company and formalities for financing a company.
- To able to conduct different meetings in the company and recording of the proceedings.

Pre-Requisites: Basic Knowledge in Companies**Course Outcomes:**

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
CO1	Explain the basic concepts and different types of companies	K1
CO2	Communicate the knowledge about the formation of companies and contents of the prospects	K2
CO3	To assist the students to understand the different types of shares and debentures	K1
CO4	Apply the laws governing various formalities about meetings and proceedings	K3
CO5	Ability to identify the duties and responsibilities of directors	K2

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS:

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Company – Definition of Company – Characteristics – Advantages of a company – Kinds of companies – Private Ltd Company Vs Public Company – New Companies Act 2013.	8	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Formation of Companies – Incorporation of Company – Memorandum of Association – Clauses – Articles of Association – Contents – Prospects - Contents.	9	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Share capital – kinds of Share capital –Shares – Types of Shares –Application and Allotment of shares – Forfeiture of Shares – Debentures – Features – Types of Debentures .	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Meetings – Definitions of Meetings – General Meetings of Shareholders – Statutory Meeting – Annual General Meeting – Extraordinary General Meeting – Class Meeting – Quorum for Meeting – Proxy – Resolution – Minutes	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Company Management – Appointment of Directors – Powers, Duties and Liabilities of Directors – Winding of Company – Voluntary Winding up – Types of Voluntary Winding up – Winding up by Court – Consequences of Winding up – Dissolution of Company	8	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Share certificate and Share warrant– Transfer of shares – Lien on shares – Premium and Discount – Minimum subscription – Dividend – Types.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Books:

1. N.D. Kapoor (2017), *Company Law*, Revised Edition, Sultan Chand & Sons.
2. G.K. Kapoor and Sanjay Dharnija (2023), *Company Law and Practice*, 25th Edition, Taxmann's.
3. S C Tripathi, (2019), *New Company Law*, 2nd Edition , Central Law Publication.
4. CS N.S.Zad and CS Divya Bajpai, (2023), *Company Law*, 5th Edition, Taxmann Publication.
5. Madhu Tyagi and Arun Kumar, (2003), *Company Law*, Atlantic Publishers.

Books for Reference:

1. PMS.Abdul Gaffoor and S.Thothadri. (2017), *Company Law and Secretarial Practice*, Vijay Nicole Imprints.
2. Kuchhal M.C. and Vivek Kuchhall, (2012), *Merchantile Law*, 8th Edition ,Vikas Publishing Pvt.Ltd. Noida.
3. Avtar Singh, (2016), *Company Law*, Eastern Book Co.(EBC).
4. PPS Gogna, (2016), *A Textbook of Company Law*, 11th Edition, S.Chand Publishing
5. Dr.S.R.Myneni , (2021), *Company Law Companies Act 2013*, Asia Law House.

Web Resources:

1. <https://lawbhoomi.com/companies-act-notes-and-study-materials/>
2. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBAA1402.pdf
3. <https://unacademy.com/content/ca-foundation/study-material/business-laws/the-companies-act-2013/>

Pedagogy: Lecture, Assignments, Seminar and Quiz

Course Designer: Dr. A. SIVARANJANI, Associate Professor.

GENERIC ELECTIVE COURSE –II (GEC): EXPORT MANAGEMENT

2022 – 2023 BATCH ONWARDS

SEMESTER IV	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UBA4GEC2	EXPORT MANAGEMENT	GENERIC ELECTIVE COURSE	2	2

Course Objectives:

- To design a foundation for the students who seek a career in international markets.
- To enlighten the students' knowledge about international business practices, customs and policies and shipping.

Pre-Requisites: Basic Knowledge in exports.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Critique the framework of Export in International Scenario.	K1
CO2	Design various strategies and practices for Export.	K2
CO3	Plan suitable mode of transportation.	K3
CO4	Discuss the payment and pricing for Export procedures.	K3
CO5	Outline the EXIM Policy in India	K3

MAPPING OF CO WITH PO AND PSO :

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1”-Slight(Low) Correlation-“2”- Moderate (Medium) Correlation-
“3”- Substantial (High) Correlation –“-“ indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Introduction to Export Management: Definition - Need for Export Management - Nature of export management - Functions of an export manager.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Organising an export firm: Introduction - Setting up of an export firm - Registration procedure - Process of Execution of an order - Criteria for selection of product for export.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Export Pricing: Introduction - Factors determining Export Pricing - Export Pricing Quotations - Export Pricing Strategies.	5	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Export Finance: Introduction - Importance of Export Finance - Pre and Post Shipment Finance - EXIM Bank – Meaning - Objectives and functions.	7	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Export Procedure: Introduction - Stages in Export Procedure - Export Incentives.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Organisation structure of an export firm - Need for Export marketing plan - Modes of entry in foreign markets.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Khurana P K, (2019), *Export Management*, I Edition, Bookage Publications, New Delhi.
2. Balagopal TAS, (2016), *Export Management*, 22nd Edition, Himalaya Publishing House, Mumbai

Books for Reference:

1. Francis Cherunilam, (2019), *International Trade and Export Management*, Himalaya Publishing House, Mumbai
2. Kapoor D C, (2010), *Export Management*, Vikas Publishing House, New Delhi

Web Resources:

1. <http://vskub.ac.in/wp-content/uploads/2020/04/FINANCIAL-SERVICES-6th-Sem.pdf>
2. <http://kamarajcollege.ac.in/Department/BBA/II%20Year/e003%20Core%2011%20-%20Financial%20Services%20-%20IV%20Sem.pdf>
3. <https://academyfinancial.org/journal>
4. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBAA1403.pdf

Pedagogy: Lecture, Assignments, Seminar and Quiz.

Course Designer: Dr. M. GAYATHRI, Associate Professor.

SKILL ENHANCEMENT COURSE –I (SEC): STRESS MANAGEMENT

2022 – 2023 BATCH ONWARDS

SEMESTER IV	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UBA4SEC1	STRESS MANAGEMENT	SKILL ENHANCEMENT COURSE	2	2

Course Objectives:

- Identify current and potential sources of stress in students' lives.
- Understand the physiological effect of stress on an individual's health.
- Use stress management techniques learned in class to develop a stress resistant lifestyle.

Pre-Requisites: Basic Knowledge of causes of stress.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Explain the sources and types of stress in order to implement appropriate stress management techniques.	K1
CO2	Analyze effectiveness of stress in human body system and causes of diseases.	K3
CO3	Develop an impact of stress on personality and Perception processes.	K4
CO4	Practice the basic elements of the relaxation response.	K3
CO5	Identify common stressors inherent in today's global marketplace.	K3

MAPPING OF CO WITH PO AND PSO :

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1”-Slight(Low) Correlation-“2”- Moderate (Medium) Correlation-
 “3”- Substantial (High) Correlation –“-“ indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Definition of stress and stressor - Nature of Stress - Sources of Stress - Types of stress - Consequences of Stress - Stress and the college student.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Impact of Stress in body systems - Stress and Nervous System - Stress and Major psychiatric disorders - Role of stress emerging as a disease.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Understanding your stress level - Role of personality pattern - Self Esteem - Locus of control - Role of thoughts beliefs and emotions - Effect of stress on relationship.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Developing cognitive coping skills - Autogenic Training, Imagery and Progressive relaxation - Other relaxation techniques - Exercise and health - DIY strategies of stress Management.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Connection between social support and stress - Types of social support – Role of communication in managing stress and in work performance - Emotional intelligence – Basic concepts.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Scope of Stress Management – Health risk associated with stress – Effects of stress in daily life – Key dimensions of Time Management – Do's and Don'ts of relaxation.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Ashokkumar A, (2022), *Stress Management*, Shanlax Publications, Madurai.
2. Prerna Sharma, (2023), *Stress Management*, Vipul Publications.
3. Heena T Bhgtani, (2019), *Stress Management*, Himalaya Publishing House, Mumbai.

Books for Reference:

1. Olpin M and Hesson M, (2020), *Stress Management for Life: A Research-Based Experiential Approach.*, Himalaya Publishing House, Mumbai.
2. Lee, K, (2014), *Reset: Make the Most of Your Stress: Your 24-7 Plan for Well-being*, Universe Publishing.

Web Resources:

1. <http://egyankosh.ac.in/handle/123456789/72262>
2. https://www.researchgate.net/publication/358186602_STRESS_MANAGEMENT
3. <https://emergency.unhcr.org/sites/default/files/Strtess%20Management-textbook.pdf>
4. <http://www.gov.pe.ca/photos/original/StressManage.pdf>

Pedagogy: Lecture, Power point presentations, Seminar, Assignment, Brain storming.

Course Designer: Dr.J.TAMILSELVI, Professor and Head.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited (III cycle) with 'A' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF BUSINESS ADMINISTRATION



BBA SYLLABUS

2022 -2023 and Onwards



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF BUSINESS ADMINISTRATION

BBA

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the candidates admitted from the academic year 2022 – 2023 onwards)

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
V	III	Core Course - VII (CC)	Entrepreneurial Development	22UBA5CC7	6	6	3	25	75	100
		Core Course – VIII (CC)	Research methods in Management	22UBA5CC8	5	5	3	25	75	100
		Core Course - IX (CC)	Management Accounting	22UBA5CC9	5	5	3	25	75	100
		Core Course - X (CC)	Digital Marketing	22UBA5CC10	5	5	3	25	75	100
		Discipline Specific Elective – I (DSE)	Basics of Income Tax	22UBA5DSE1A	5	4	3	25	75	100
			Managerial Communication	22UBA5DSE1B						
			Retail Management	22UBA5DSE1C						
	IV	Ability Enhancement Compulsory Course- IV (AECC)	UGC Jeevan Kaushal Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Statistical Package for Managers – SPSS (P)	22UBA5SEC2P	2	2	3	40	60	100
	V	Extra Credit Course	SWAYAM		As per UGC Recommendation					
		Total			30	29				700

CORE COURSE VII – ENTREPRENEURIAL DEVELOPMENT

(2022-2023 Batch Onwards)

Semester V	Internal Marks 25	External Marks 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UBA5CC7	ENTREPRENEURIAL DEVELOPMENT	CORE	6	6

Course Objectives:

- To impart the basic knowledge of Entrepreneurial Development so that they may stand on their own, which is the need of the hour in a land of unemployment.
- To encourage the students to set up their own ventures and contribute to national economic development.

Pre-Requisites: Basic Knowledge in Entrepreneurship.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Explain the basic concepts of Entrepreneurial Development and to discuss the entrepreneurial skills to the students.	K1
CO2	Analyse the Entrepreneurial Environment and to plan for the growth of entrepreneurship in economic development.	K3
CO3	Design the course content and curriculum of EDP and to Evaluate the performance of Entrepreneurial Development programme.	K3
CO4	Explain the concept of project and to identify the various sources of business idea.	K3
CO5	Formulate the projects and analyse its elements and to prepare the project report.	K3

MAPPING OF CO WITH PO AND PSO:

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
 “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS:

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Entrepreneur – Evolution – Definition –Qualities of entrepreneurs –Types and function of entrepreneurs — Entrepreneurship - Barriers – Role of entrepreneurship in economic development - Intrapreneur – Distinction between entrepreneur and Intrapreneur – Innovation and Entrepreneurship.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Entrepreneurial Environment - Factors affecting Entrepreneurial Environment - Social Responsibility of Business - Entrepreneurial Motivation – Types – Nature - Importance of motivation - Motivating factors – Entrepreneurial Growth.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Entrepreneurial Development Programme – Need for EDPs – Objectives and Phases of EDP – Course Content and Curriculum - EDP Institutions in India and their functions – DIC – SIDO – NSIC – SIDCO – SISI – TCO- SIPCOT – ITCOT – NIESBUD - Venture Capital.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Project Management – Concept of project - Sources of a business idea – Project Classification - Project Identification – Project formulation – Elements - Project Report – Project Appraisal - Sources of Finance - Self Help Groups. E-Cell - Meaning and Concept of E-Cell – Advantages to join E-Cell - Functions of E-Cell.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	MSME - Steps for starting MSME – Government Schemes - Incentives and Subsidies for Entrepreneur – Benefits to Industrial Units Located in Backward Area – Industrial Estate - Rural Entrepreneurs – Women Entrepreneurs – Steps to encourage women entrepreneurs – Problems faced by women entrepreneurs - Startups – Types of Start ups – Importance of Startups.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) History of Entrepreneurship Development – Future of Entrepreneurship – Dealing with basic and initial problems of setting up of Enterprises – Business Plan.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Books:

- 1.P.Saravanavel and P.Sumathi(2020), *Entrepreneurial Development*, Margham Publications.
- 2.C.B. Gupta and N.P.Srinivasan (2017), *Entrepreneurial Development*, Sultan Chand and Sons, New Delhi.
- 3.Khanka S.S (2007), *Entrepreneurial Development*, 2011th Edition, S.Chand and Company Ltd, New Delhi.
- 4.Vasant Desai(2009), *Dynamics of entrepreneurial development*, Himalaya publishing House.
- 5.E.Gardon and K.Natrajan(2009), *Entrepreneurship Development*, Himalaya publishing House.

Books for Reference:

1. Bhadra and Satpati(2023), *Entrepreneurship Development*, First Edition, Dishari Prakashani,
2. Satish Taneja and S.L. Gupta (2004), *Entrepreneur Development*, 2nd Edition, Galgotia Publishing Company.
3. Anupam Karmakar(2023), *Entrepreneurship Development*, First Edition, Oriental Book Company Private Limited.
4. Robert D. Hisrich, Michael P. Peters, Dean Shepherd and Sabyasachi Sinha(2020), *Entrepreneurship*, Eleventh Edition, McGraw Hill.
5. M.Neela and J.Tamilselvi(2019) , *Entrepreneurship Development*, Charulatha Publications.

Web Resources:

1. <https://www.hhrc.ac.in/ePortal/Commerce/I%20M.Com.%20-%2018PCO1%20-%20Dr.%20R.%20Sathru%20Sangara%20Velsamy%20&%20Dr.%20P.%20Sailaja.pdf>
2. https://ddceutkal.ac.in/Syllabus/MCOM/Entrepreneurship_Development.pdf
3. <https://www.hit.ac.in/download/LectureNote/MBA/2ndSem/MBA%202nd%20Sem%20Entrepreneurship%20Development.pdf>
4. <https://www.pasc.edu.in/wp-content/uploads/2021/04/ENTREPRENEURSHIP-DEVELOPMENT-III-BBA.pdf>
5. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBAX1024.pdf

Pedagogy: Lecture, Power Point Presentation, Assignment, Seminar, Group projects

Course Designer: DR.M.NEELA, Associate Professor.

CORE COURSE VIII – RESEARCH METHODS IN MANAGEMENT
2022-2023 Batch onwards

Semester V	Internal Marks 25	External Marks 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UBA5CC8	RESEARCH METHODS IN MANAGEMENT	CORE	5	5

Course Objectives:

- To gain thorough knowledge on the development of the research projects
- To acquire theoretical and practical background of research

Pre-Requisites: Basic Knowledge in Research

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Explain the basic concepts of Research and its ethics.	K1
CO2	Select and to identify the sources of research problem and to Formulate the research problem	K2
CO3	Discuss the stages in preparation of Research Design.	K3
CO4	Select the sampling techniques and to compare the probability and Non probability sampling methods.	K3
CO5	Prepare Research Report and to outline the Research report	K3

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Concept of research: Meaning – Objectives – purpose - criteria for good research - Type of Research – pure – applied – historical – analytical - descriptive and experimental research - Pilot Study – Case study method - Research Ethics.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Research problem- Meaning- Formulation of Research Problem – Identification and Selection of Research Problem - Research design - meaning – Stages in the preparation of Research Design – Exploratory - Descriptive and Causal Research Design - A Model Design – Concept of Independent and Dependent Variables.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Sampling – Meaning - Nature - Need – Determination of Sample Size - Advantages and disadvantages – Types - Probability - Non-probability Sampling - Sampling Error - Hypothesis – Meaning – Characteristics – Types of Hypothesis – Type I Error & Type II Error.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Collection of Data – Primary and Secondary sources – Methods of Data Collection - Construction of Questionnaire – Measurement Scale - Validity and Reliability – Presentation – Editing - Coding and Tabulation – Analysis and Interpretation of Data.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Research Report – Meaning – Types-Steps in Organization of Research Report – Significance of Report writing – Content of research report – Bibliography – Reference Management Software - Mendeley - Plagiarism – Software for detection of Plagiarism - Ethical issues related to publishing.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Research Process - Business Research – Social Science Research - Pilot Study – Pre - testing - Levels of Measurement – Univariate analysis - Bivariate analysis – Cross Tabulations.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Books:

1. C.R.Kothari and Gaurav Garg (2023), *Research methodology: Methods and Techniques*, 5th Edition, New Age International Publisher.
2. Ranjit Kumar(2023), *Research Methodology: A step by step guide for beginners*, 4th Edition, Sage Publications Private Limited.
3. S.Sachdeva(2022), *Research Methodology*, Laxminarayan Agarwal.
4. Shashi K.Gupta and Praneet Rangi (2018), *Research Methodology: Methods, Tools and Techniques*, Kalyani Publishers.
5. R.Panneerselvam(2013), *Research Methodology*, 2nd Edition, Prentice Hall India Learning Private Limited.

Books for Reference:

1. Pranjal Bora, Jibon Saikia and Anil Hazarika(2023), *A Concise Book on Research Methodology and Research and Publication Ethics*, Notion Press.
2. R.K. Jain(2021), *Research Methodology: Methods and Techniques*, Special Edition, Vayu Education of India.
3. M.Neela and J.Tamilselvi(2019), *Research Methods in Management*, Charulatha Publications Private Limited.
4. P.Saravanavel(2018), *Research Methodology*, Kitab Mahal
5. Ahuja Ram(2001), *Research Methods*, Rawat publications.

Web Resources:

1. <https://old.amu.ac.in/emp/studym/99999204.pdf>
2. <http://14.139.185.6/website/SDE/sde578.pdf>
3. <https://old.mu.ac.in/wp-content/uploads/2014/04/Research-Methodology.pdf>
4. <https://ccsuniversity.ac.in/bridge-library/pdf/Research-Methodology-CR-Kothari.pdf>
5. <https://kamaraajcollege.ac.in/wp-content/uploads/Core-Research-Methodology.pdf>

Pedagogy: Lecture, Power Point Presentation, Assignment, Seminar, Group projects

Course Designer: Dr.M.Neela, Associate Professor.

CORE COURSE IX – MANAGEMENT ACCOUNTING

2022-2023 Batch onwards

Semester V	Internal Marks 25	External Marks 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UBA5CC9	MANAGEMENT ACCOUNTING	CORE	5	5

Course Objectives

- To gain knowledge in the preparation of financial statement analysis, marginal costing, budget, working capital, standard costing and
- Utilize the management tools and techniques to take appropriate financial decisions.

Pre-Requisites: Basic Knowledge in Management Accounting

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Evaluate the financial statement analysis for strategic decision making of firm	K1
CO2	Examine the solvency, turnover/performance and Liquidity of a business by using live data	K2
CO3	Evaluate the magnitude and pattern of Sources and Application of fund under different head of account	K3
CO4	Show Budget for each managerial function and flexible budgets to exercise budgetary control over functions/level of activity of firm	K3
CO5	Use Standard costing system to analysis the causes of labour, material, overhead and sales margin variances between Standard and Actual cost	K3

MAPPING WITH PROGRAMME OUTCOME:

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
 “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Management Accounting – Definition – Objectives– Scope and Functions of Management Accounting Financial Statement Analysis – Comparative Statements – Common size Statement-Trend Analysis – Preparation of Income Statement and Balance Sheet with Ratios. Annual report Discussion.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Meaning – Concept of Fund and Funds flow statement –Managerial users of Fund Flow statement- Construction of FFS, Cash flow analysis – Meaning and Concept –Construction of cash flow statement.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Marginal Costing –Features-Merits and Demerits - Cost Volume Profit (CVP) Analysis – Break Even Analysis – Margin of Safety.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Budget and Budgetary Control – Sales – Production - Selling Overhead - Raw Material Cost – Cash - Master Budgets and Flexible Budget.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Working Capital – Factors determining Working Capital – Estimate of Working Capital requirements – Standard Costing – Material and Labour Variance only.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Nature and Scope of Management Accounting-Relationship between Financial Accounting – Cost Accounting and Management Accounting Annual report Discussion- Comparison between fund flow and cash flow statement- Distinction between Absorption Costing and Marginal Costing – Working Capital – Types.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Dr. Rajiv Goel & Manmohan, (2013), *Management Accounting*, 1st Edition, International Book House Pvt Ltd.
2. Dr. S.N. Maheswari, (2022), *A Textbook of Accounting for Management*, 5th Edition, Vikas Publishing House.

Books for Reference:

1. R.S.N. Pillai & Bagavathi, (2010), *Management Accounting*, 4th Edition, S. Chand
2. Shashi K. Gupta & R.K. Sharma, (2017), *Management Accounting Principles and Practice*, 13th Revised Edition, Kalyani Publishers.
3. M.Y. Khan & P.K. Jain, (2021), *Management Accounting*, 8th Edition, Mc Graw Hill education.
4. I.M. Pandey, (2010), *Management Accounting*, 3rd Edition, Vikas Publication House Pvt Ltd.

Web Resources:

1. <https://www.accountingformanagement.org/>
2. <https://in.imanet.org/about-ima/professional-publications-and-reports/management-accounting>
3. <https://www.aicpa-cima.com/>
4. <https://www.zoho.com/accounting-software/>

Pedagogy: Lecture, Assignments and Quiz

Course Designer: Mrs. P. Thangamani, Assistant Professor.

CORE COURSE X (CC) – DIGITAL MARKETING
(2022-2023 Batch Onwards)

Semester V	Internal Marks 25	External Marks 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UBA5CC10	DIGITAL MARKETING	CORE	5	5

Course Objectives:

- To facilitate the students to develop an overall understanding of digital marketing and online platforms and increase their job opportunities.
- Assessing the present social media presence and Industry benchmarking.
- To inculcate the entrepreneurial qualities among the students with sufficient knowledge about online marketing channels for starting their own online business.
- Application of social media tools for marketing, advertising, networking and personal branding.

Pre-Requisites: Basic Knowledge in Digital Marketing.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Explain the basic concepts of Digital Marketing.	K1
CO2	Discuss the Digital Marketing Techniques such as Search Engine Optimization (SEO) & Search Engine Marketing (SEM), Content Marketing, Display Advertising.	K2
CO3	Apply the concept of social media marketing and the rise of online social networking sites.	K3
CO4	Utilize the social media platforms such as face book, twitter, instagram, you tube.	K3
CO5	Identify the challenges and opportunities in the Digital Marketing and Creation of Website.	K3

MAPPING OF CO WITH PO AND PSO :

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	2	3	3	3	3	2	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Introduction to Digital Marketing: Digital Marketing – Meaning – Definition - Concept - History of Digital Marketing - Importance of Digital Marketing – Scope – Characteristics - Merits and Demerits – Digital Marketing Strategies – Types of Digital Marketing – Innovative Ideas of Digital Marketing.	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Digital Marketing Techniques: Digital Marketing Techniques – Display Advertising – Web Analytics- Website Planning and Creation - Search Engine Optimization (SEO)- Email Marketing- Mobile Marketing -Content Marketing – Content Bucketing- Web Advertising – Web Remarketing – Affiliate Advertising – Podcast Marketing – Influencer Marketing - Video Marketing - Search Engine Marketing (SEM) Pay-Per-Click Advertising.	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Social Media Marketing: Social Media Marketing – Meaning – Definition – History of Social Networking sites – Evolution of Social Media – Benefits of Social Media Marketing – Limitations of social media marketing- Social Media Marketing Techniques - Social Media Streaming – Live Streaming Softwares - Open Broadcaster Software (OBS).	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Social Media Platforms: Social Media platforms –Meaning – scope – Advantages – Disadvantages — Twitter – Face book – Instagram - Linked in – You tube – Threads – Blogs – Guest Blogging - Types of users on social networks - Sharing content on Social Media - DO's and Don'ts of Social media.	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Future of Digital Marketing: Challenges Faced by Digital Marketing – Measures for making effective Digital Marketing - Trends in Digital Marketing. - E-Malls - E-Storefront - E-Marketplace - E- Marketing Tools- Creating a Website - Website Design and Development.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Digital Media Planning and Buying – Concept of Cost Per Install (CPI), Cost Per Order (CPO), Cost Per Acquisition (CPA), Click Through Rate (CTR).		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Books:

1. Puneet Singh Bhatia (2023), *Fundamentals of Digital Marketing*, Pearson Publication
2. Seema Gupta(2022), *Digital Marketing*, 3rd Edition, Mc Graw Hill Education.
3. Amresh Bharti(2022), *Digital Marketing*, Invincible Publication.
4. Nitin C Kamat and Chinmay Nitin Kamat (2018), *Digital Social Media*, Himalaya Publishing House
5. Tracy L.Tuten& Michael R.Solomon (2017), *Social Media Marketing*, SAGE Publication.

Books for Reference:

1. Poorva Mathur(2023), *Digital Marketing*, Galgotia Publishing Company.
2. Satinder Kumar and Supreet Kaur(2023), *Digital Marketing*, 2023rd Edition, Taxamann Publications Private Limited.
3. V.Venkata Krishna (2023), *Digital Marketing for Beginners: A Road Map to successful career in Digital Marketing*, Notion Press.
4. Ryan Deiss and Russ Henneberry (2020), *Digital Marketing for dummies*, First Edition, Wiley.
5. Ian Dodson(2016), *The Art of Digital Marketing: The Definitive Guide to Creating Strategic, Targeted and Measurable Online Campaigns*, First Edition, Wiley.

Web Resources:

1. <https://kamarajcollege.ac.in/wp-content/uploads/Core-14-Digital-Marketing.pdf>
2. <https://www.digitalmarketer.com/digital-marketing/assets/pdf/ultimate-guide-to-digital-marketing.pdf>
3. https://josephscollege.ac.in/lms/Uploads/pdf/material/DigitalMarketing_Notes.pdf
4. https://www.tutorialspoint.com/social_media_marketing/social_media_marketing_tutorial.pdf
5. http://www.gov.pe.ca/photos/original/IPEI_ebiz_smmkt.pdf

Pedagogy: Lecture, Power Point Presentation, Assignment, Seminar.

Course Designer: DR.M.NEELA, Associate Professor.

**DISCIPLINE SPECIFIC ELECTIVE – I (DSE) : BASICS OF INCOME TAX
2022 – 2023 BATCH ONWARDS**

SEMESTER V	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UBA5DSE1A	BASICS OF INCOME TAX	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives:

- To aim at making students understand and apply the basic provisions related to income tax.
- To able the students to compute his own income tax returns filing procedure on year to year basis

Pre-Requisites: Basic Knowledge about Taxation.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Able to understand basic taxation structure in India as per the Constitution of India.	K1
CO2	To understand basic provisions regarding computation of taxable income of an individual for the current assessment year, whether from Salary or Business/Profession or other sources of Income.	K2
CO3	To make numerical calculations of taxable income and exempt income as per the method of calculation prescribed under Income Tax Act, and tax payable on the same.	K3
CO4	Acquire knowledge about submission of income tax return, payment of due taxes in the form of advance tax, self-assessment tax and tax deducted at source.	K3
CO5	Get acquainted with e-processes related to income tax filing and assessment.	K3

MAPPING OF CO WITH PO AND PSO :

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1”-Slight(Low) Correlation-“2”- Moderate (Medium) Correlation-
“3”- Substantial (High) Correlation –“-“ indicates there is no correlation.

SYLLABUS:

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	General introduction of Indian income tax act, 1961. Basic concepts: Income - Agriculture income - casual income previous year - assessment year - gross total income - total income, person assessee - residential status and tax liability - exempted income.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Income from salary - Income from house property.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Income from business and profession - Capital gains - Income from other sources.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Set off and carry forward of losses - Deductions from gross total income - Clubbing of income - Computation of total income and tax liability of an individual.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Assessment procedure - Permanent Account Number (PAN) tax deducted at source. Advance payment of tax - Income tax authorities - Appeal, revision and penalties.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Various Income Tax Returns Forms and their Applicability - E-Filing of Income Tax Returns.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Lal B B, (2010), *Income Tax*, I Edition, Pearson Education, Chennai.
2. V.G. Mehta, (2022), *Income Tax Ready Reckoner*, Shri Kuber Publishing House, Mumbai.

Books for Reference:

1. Vinod K.Singhania, Monica Singhania (2023), *Students' Guide to Income Tax*, Taxmann, New Delhi
2. Manoharan T N & Hari G R , (2023), *Students' Handbook on Taxation*, Snow White Publications Pvt. Ltd, Mumbai.

Web Resources:

1. <https://www.incometaxindia.gov.in> for relevant provisions of Act and Rules applicable to concerned assessment year.
2. <https://www.incometaxindiaefiling.gov.in> for registration on portal, viewing 26AS (tax credits), e-filing and other relevant procedures

Pedagogy: Lecture, Assignments, Seminar and Quiz.

Course Designer: DR. M. GAYATHRI, Associate Professor.

DISCIPLINE SPECIFIC ELECTIVE – I: MANAGERIAL COMMUNICATION
2022-2023 Onwards

SEMESTER V	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UBA5MBE1B	MANAGERIAL COMMUNICATION	DISCIPLINE SPECIFIC ELECTIVE	5	4

Objectives:

- To make them know the significance and principles communication.
- To enable students to write reports and speeches on topics related to business.
- To develop the ability to research and write a documented paper and/or to give an oral presentation.

Pre-Requisites: Basic Knowledge about Communication.

Course Outcomes:

On the successful completion of the course, students will be able to:

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Identify and demonstrate the use of Managerial Communication	K1
CO2	Discuss the types of communication	K2
CO3	Plan effective and concise letters and memos	K2
CO4	Explain the listening and communication skills	K3
CO5	Prepare Formal and Informal Reports.	K3

MAPPING OF CO WITH PO AND PSO :

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1”-Slight(Low) Correlation-“2”- Moderate (Medium) Correlation-
“3”- Substantial (High) Correlation –“-“ indicates there is no correlation.

SYLLABUS:

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Communication – Meaning - Definition and objectives - Principles – Types - Process of Communication – importance of managerial Communication – Communication Barriers - Overcoming communication barriers.	13	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Business Letters - Kinds - Layout of letter - Enquiries and Replies - Offers and Quotations - Orders - Execution and Cancellation Letter.	11	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Claims and Adjustments - Sales letters - Parts of Sales Letter - Complaints and Adjustments - Collection letters - Circular letters.	13	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Agency Correspondence - Import & Export Correspondence. Important terms used in Import and Export Correspondence - Modern means of communication - Video Conferencing, Fax, E-Mail, Internet.	13	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Report Writing - Meaning, Importance of Reports - Types of reports - Characteristic of Good Report - Preparation of Resume and Mock Interview.	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Business Layout and Parts - Claims and Adjustments - Selecting suitable types of reports – Oral Communication practices.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Books:

1. M.S.Ramesh, Pattanshetti & Madhumati M Kulkarni (2003), *Effective Business English and Correspondence*, R.Chand & Co.
2. R.C.Sharma, Krishna Mohan (2007), *Business Correspondence and Report Writing*, 3rd Edition Tata McGraw Hill Publishing Company Limited.
3. Mary Munter, Lynn Hamilton (2013), *Guide to Managerial Communication: Effective Business Writing and Speaking*, 10th Edition, Pearson Publication.
4. Geraldine E. Hynes (2015), *Managerial Communication: Strategies and Applications*, Sixth Edition, Sage Publications.
5. R C Sharma, Krishna Mohan, Virendra Singh Nirban (2020), *Business Correspondence and Report Writing*, 6th Edition, McGraw Hill Publication.

Books for Reference:

1. Herta A Murphy, Herbert W Hildebrandt & Jane P Thomas (2017), *Effective Business Communication*, 7th Edition McGraw Hill Education.
2. Rajendra Pal & J.S.Korlahalli (2014), *Essentials of Business Communication*, 13th Edition, Sultan Chand & Sons.
3. Jeanette S. Martin, Reginald L. Bell (2019), *Managerial Communication for organizational Development*, 2nd Edition, Business Expert Press.

Web Resources:

1. <https://edu.gcglobal.org/en/business-communication/how-to-write-a-powerful-business-report/1/#>
2. <https://in.search.yahoo.com/search?fr=mcafee&type=E211IN714G0&p=managerial+communication>
3. <https://www.smartbusinessbox.in/types-of-business-letter-and-formats/>
4. <https://harappa.education/harappa-diaries/management-communication/>
5. <https://www.indeed.com/career-advice/interviewing/mock-job-interview#:~:text=Preparing%20for%20your%20mock%20interview%20like%20a%20real,performance%20when%20you%20meet%20with%20a%20hiring%20manager.>

Pedagogy: Interactive Lectures, Presentations, Assignments

Course designer: Mrs.A.SUGANYA, Assistant Professor.

**DISCIPLINE SPECIFIC ELECTIVE – I (DSE) : RETAIL MANAGEMENT
2022 – 2023 BATCH ONWARDS**

SEMESTER V	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UBA5DSE1C	RETAIL MANAGEMENT	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives:

- To understand the fundamental principles and concepts of retail management.
- To provide a basic understanding to broad set of specialized activities and techniques in managing Retail Business.

Pre-Requisites: Basic Knowledge about retail industry.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Able to understand basics of retailing and its economic significance.	K1
CO2	To understand the retailing channel and Retail Market Strategy	K2
CO3	Acquire knowledge on Retail Store Location and Visual Merchandising.	K3
CO4	To apply knowledge about retail Pricing Strategies and Approaches.	K3
CO5	Get acquainted with Retail Information System	K3

MAPPING OF CO WITH PO AND PSO :

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1”-Slight(Low) Correlation-“2”- Moderate (Medium) Correlation-
“3”- Substantial (High) Correlation –“-“ indicates there is no correlation.

SYLLABUS:

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Retailing: Introduction to Retailing – Retailing and Economic Significance – Types of Retailers – Trends - Characteristics - Non-Store Retailing.	8	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Retailing Channel: Multi Channel Retailing – Retail Channels for Interacting with Customers – Retail Market Strategy	8	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Retail Location and Sight Selection: Retail Store Location – Planning - Location selection decision process - Analysis of Location decision - Factors affecting site selection and location decision - Visual Merchandising.	8	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Pricing Strategies and Approaches : Retail Pricing - Factors affecting Pricing - Retail Pricing Strategy - Pricing Adjustments - Retail Marketing Communication and Advertising - Choice of Media and Media selection Decision.	8	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Retail Information System: Nature - Scope and Characteristics of Retail information System - Role of MIS in Retail Marketing, - Data warehousing and Mining. .	8	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Customer Service and its Practices in India - Electronic Data Inter change - Universal Product Code - Point of Sales Terminals - Radio Frequency Identification - Self Regulatory Check out System - Familiarity with software Packages like MS Office, MS Windows, LAN, UNIX etc, .		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Michael Levy and Barton A Weitz,(2001), *Retailing Management*, Tata Mc Graw Hill, New Delhi
2. S.C.Bhatia (2008),*The retail management*,1st Edition, Atlantic publisher & distribution, Mumbai.

Books for Reference:

1. Barry Bermans and Joel Evans, (2001), *Retail Management – A Strategic Approach*, 8th Edition, PHI Private Limited, New Delhi
2. A.J. Lamba, (2003), *The Art of Retailing*, 1st Edition, Tata Mc GrawHill, New Delhi
3. Gilbert Pearson,(2003), *Retail Marketing*, Education Asia,
4. Gourav Ghosal, (2010), *Retail Management*, Maxford Books Publishing House, New Delhi.
5. Dr. L. Natarajan (2016), *Retail Management*, Margham Publications, Chennai

Web Resources:

1. https://scholar.google.co.in/scholar?q=retailing+and+economic+significance&hl=en&as_sdt=0&as_vis=1&oi=scholar
2. <https://nrf.com/>
3. <https://www.retailpro.com/News/blog/>
4. <https://www.rmsservicing.com/articles/what-is-visual-merchandising/#:~:text=Visual%20merchandising%20is%20a%20marketing,the%20person%20behind%20the%20ma>

Pedagogy: Lecture, Assignments, Seminar and Quiz.

Course Designer: DR. S.THAMARAI SELVI , Associate Professor.

SKILL ENHANCEMENT COURSE-II : STATISTICAL PACKAGE FOR MANAGERS – SPSS (P)

2022 – 2023 BATCH ONWARDS

SEMESTER V	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UBA5SEC2P	STATISTICAL PACKAGE FOR MANAGERS - SPSS(P)	SKILL ENHANCEMENT COURSE	2	2

Course Objectives:

- To determine how SPSS can be a useful tool.
- To evaluate and analyse students' performance with the help of histogram and Chi-Square Test.

Pre-Requisites: Basic Knowledge about Communication.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Define the statistical terms and its measures	K1
CO2	Describe the procedure to compute descriptive statistical measure	K2
CO3	Recognise the applications of Statistical measure	K3
CO4	Compare data using descriptive measures	K3
CO5	Predict the variation using Regression	K3

MAPPING WITH PROGRAMME OUTCOME:

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	2	3	3	2	3	3	3	3
CO3	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	2	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

1"-Slight(Low) Correlation-"2"- Moderate (Medium) Correlation-

"3"- Substantial (High) Correlation –"- indicates there is no correlation.

SYLLABUS:

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Introduction – SPSS – Classification - Techniques - Basics of SPSS – Getting started with SPSS – Scaling and Measurement - Data Entry in SPSS.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Data Manipulation – Construction of Frequency Distribution Tables – Cross Tabulation.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Graphical Representation of Data – Charts and Graphs – Computation of Mean – Median – Mode and Standard Deviation - Measures of Skewness and Kurtosis-One - way Anova.	5	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Tabulation of data – Statistical Analysis II – T test (Comparison of Means) – Statistical Analysis III – Chi-Square test - Pearson Correlation of co-efficient and Spearman's rank correlation - Simple linear Regression.	7	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Report Writing – Written and Oral reports- Sampling and Non-sampling error - Questionnaire - Drafting of questionnaires - Pilot surveys.	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Role of SPSS- Tabulation of data – Presenting Results.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Andy Field,(2019), *Discovering Statistics through IBM SPSS Statistics*, 5th Edition, SAGE Publications India PvtLimited.

Books for Reference:

1. Saravanavel,(2018), *Research Methodology*, New Edition, Sultan Chand .
2. C.R. Kothari,(2019), *Research Methodology*, Fourth edition, New Age International Publishers.

Web Resources:

1. <https://www.ibm.com/products/spss-statistics>
2. <https://online.stat.psu.edu/statprogram/tutorials/statistical-software/spss>
3. <https://www.spss-tutorials.com/spss-what-is-it/>
4. <https://en.wikipedia.org/wiki/SPSS>

Pedagogy: Lecture, Power Point Presentation and Computer Practical

Course Designer: MRS. P. THANGAMANI, Assistant Professor.

ANNEXURE F

B.Com

(2023-2024)

II Semester



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF COMMERCE
B.Com.– PROGRAMME STRUCTURE
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the candidates admitted from the academic year 2023 – 2024 onwards)

II Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
II	I	Language Course - II (LC)	nghJj; jkpo; - II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar - II	22ULH2						
			Prose, Grammar and History of Sanskrit literature	23ULS2						
			Basic French -II	22ULF2						
	II	English Language Course - II (ELC)	General English - II	23UE2	6	3	3	25	75	100
	III	Core Course - III (CC)	Financial Accounting - II	23UCO2CC3	6	5	3	25	75	100
		Core Course -IV (CC)	Fundamentals of Marketing	23UCO2CC4	5	5	3	25	75	100
		First Allied Course - II (AC)	Banking Theory Law and Practice	22UCO2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course – II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
	Extra Credit Course		SWAYAM Online Course	As per UGC Recommendations						
		Total			30	21				600

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23UCO2CC3	FINANCIAL ACCOUNTING – II	CORE	6	5

Course Objectives

- To understand the general characteristics of a partnership.
- To develop skills in the preparation of Partnership Accounts.
- To enable the students to apply the accounting concepts in the preparation of Branch, Departmental and Hire Purchase Accounts.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the appropriate concepts relevant to partnerships and corporations.	K1
CO2	Recall and relate the accounting procedures for the partnership related transactions and explain the accounting procedures relating to branch accounts, Hire purchase accounts and Departmental accounts.	K1, K2
CO3	Explain the in-depth concepts in Partnership accounts, Hire purchases accounts and other business related transactions.	K2
CO4	Apply the accounting concepts to interpret the performance of business.	K3
CO5	Classify and Build confidence in the preparation of partnership accounts, hire purchase accounts, branch and departmental accounts.	K3, K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	2	3	3	3	3	2	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation □ “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamentals of partnership Accounts – Profit and Loss Appropriation A/c – Capital Accounts of partners (fixed and fluctuating) – Capital ratio – Change in Profit Sharing Ratio – Past Adjustments and Guarantees.	18	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Admission of a partner – Calculation of Sacrificing Ratio – Adjustment for Goodwill – Methods of valuation of Goodwill.	18	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
III	Retirement of a Partner – Calculation of Gaining Ratio – Adjustment for Goodwill - Death of a Partner – Joint Life Policy	18	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
IV	Branch Accounts (Dependent Branches: Debtor System and Stock and Debtor System only) Departmental Accounts – Apportionment of Expenses – Inter – departmental Transfer at cost and Invoice price.	18	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
V	Hire Purchase System: Accounting Treatment – Calculation of Interest – Default and Repossession – Hire Purchase Trading Account: Debtors System and Stock and Debtor System.	18	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
VI	Self-Study for Enrichment (Not to be included for External Examination) Interest on capital – Interest on drawings –Partnership deed– Types of Partner, Difference between Hire Purchase and Installment Purchase		CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4

Distribution of Marks: Theory 20% and Problem 80%

Text Books

1. Reddy. T.S, Murthy A. (2023). *Financial Accounting*. 9th Revised Edition, Margham Publication.
2. Jain S.P,&Narang K.L. (2020). *Business Accounting*. 6th Edition, Kalyani Publishers
3. Gupta R.L,& Radhaswamy M. (2022). *Financial Accounting*. 8th Edition (Reprint), Sultan Chand & Sons.

Reference Books

1. Dalston L, Cecil & Jenitra L, Merwin. (2015). *Business Accounting*. 4th Edition. Learn Tech Publishers.
2. Arulanandam M.A, Raman K.S. (2019). *Advanced Accountancy*. 8th Edition, Himalaya Publishing House.
3. Dr.Shukla.S.M. (2023). *Financial Accounting*. 52nd Revised Edition. Sultan Chand Publication.

Web Reference

1. <https://www.taxmann.com/post/blog/basics-concepts-of-accounting-for-partnership/>
2. <https://www.yourarticlelibrary.com/accounting/partnership-account/partnership-accounts-on-retirement-or-death-accounting-procedure/52380>
3. https://mastermindsindia.com/13.%20BRANCH%20ACCOUNTS_%20Assignment%20Solutions.pdf
4. https://static.careers360.mobi/media/uploads/froala_editor/files/Hire-Purchase-and-Instalment-Sale-Transactions.pdf
5. <https://www.freshbooks.com/en-za/hub/accounting/departmental-accounting>

Pedagogy

Chalk and talk, Power Point Presentation, Assignment, Seminar and Quiz.

Course Designer

Dr. D. Sarala.

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23UCO2CC4	FUNDAMENTALS OF MARKETING	CORE	5	5

Course Objectives

- To enable the students to understand the basic principles of Marketing concepts and importance.
- To identify the factors and process essential for designing marketing strategy.
- To familiarize the recent development of marketing in the global scenario and to practice the skills of marketing.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the fundamental concepts, theories of marketing and types of market.	K1
CO2	Summarize the important factors influencing consumer behavior And explain the product policy and development.	K2
CO3	Identify the different pricing strategies of a firm.	K3
CO4	Analyze and Compare the various distribution channels and Promotional programmes to market effectively.	K3,K4
CO5	Examine the social, cultural, global, ethical, environmental responsibilities and issues in marketing.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	2	3	2	3	3	3	2	3	3
CO3	3	2	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation □ “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Definition of Market and Marketing, Types of Market – Types of Goods – Evolution of Marketing – Difference between Selling and Marketing–Modern Concepts of Marketing –Nature and Importance of Marketing– Functions of Marketing.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Consumer Vs. Customer - Consumer Behaviour - Importance of Consumer Behaviour – Types of Buyers – Characteristics of buyer Behaviour – Buying Process - 7O's Framework.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
III	Product–Policy-New Product Development – Product Life Cycle – Branding and Packaging–Pricing–Factors affecting Pricing–Kinds of Pricing.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
IV	Channels of Distribution–Importance– Functions - Types– Different Channels. Sales Promotions – Objectives – Reasons for Growth – Advantages and Limitations – Effectiveness of Sales Promotion - Advertising– Basic Features – Functions- Benefits – Kinds of Advertising.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
V	Recent developments in Marketing: Social Marketing –Direct Marketing – Online Marketing – Relationship Marketing –Green Marketing – Marketing Ethics.	15	CO1,CO2,CO3,CO4, CO5	K1, K2, K3,K4
VI	Self Study for Enrichment (Not to be included for External Examination) Various environments affecting the marketing functions – Market Targeting – Distribution logistics: Importance and decisions factors to be considered in channel selection.		CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4

Text Books

1. Pillai.R.S.N,Bagavathi.V(2017).*Marketing Mangement*. Revised Edition.S.Chand&Co.
2. Dr.RajanNair.N.SanjithRNair.(2019). *Marketing*. Revised Edition. SultanChand&Sons.
3. Dr. Gupta. C.B, Dr.N.Rajan Nair. (2019). *Marketing Management*. Revised Edition. SultanChand&Sons.

Reference Books

1. Chandrasekar. K.S. (2019). *Marketing Management*. Revised Edition. Vijay Nicole Imprints Private Ltd.
2. Dr. Varshney. R.L, Dr. Gupta. S.L. (2016). *Marketing Management*. Revised Edition. Sultan Chand & Sons.
3. Philip Kotler, Gray Armstrong, Sridhar Balasubramanian, Prafulla Agnihotri. (2023). *Principles of Marketing*, Revised Edition. Pearson.

Web Reference

1. <https://www.techfunnel.com/martech/modern-marketing-concepts-marketing-management/>
2. <https://www.questionpro.com/blog/consumer-behavior-definition/>
3. <https://www.studysmarter.co.uk/explanations/marketing/pricing/>
4. <https://byjus.com/commerce/what-is-pricing/>
5. <https://www.techtarget.com/searchchannel/definition/distribution-channel>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar

Course Designer

Dr. S. Jayalakshmi

B.Com

(2022-2023)

IV Semester



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
PG & RESEARCH DEPARTMENT OF COMMERCE

B.Com.– PROGRAMME STRUCTURE

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the candidates admitted from the academic year 2022 – 2023 onwards)

IV Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
IV	I	Language Course - IV (LC)	Gz;ila ,yf;fpaKk; ciueilAk;	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French -II	22ULF4						
	II	English Language Course-IV (ELC)	Learning Grammar through Literature - II	22UE4	6	3	3	25	75	100
	III	Core Course - VII (CC)	Business Statistics	22UCO4CC7	5	5	3	25	75	100
		Core Practical- I (CP)	Accounting Package (P)	22UCO4CC1P	5	5	3	40	60	100
		Second Allied Course – II (AC)	E-Commerce and Web Designing	22UCO4AC4	4	3	3	25	75	100
	Internship			22UCO4INT	-	2	-	-	-	100
	IV	Generic Elective Course– II (GEC)	Advertisement Management	22UCO4GEC2	2	2	3	25	75	100
			Basic Tamil - II	22ULC4BT2						
			Special Tamil - II	22ULC4ST2						
		Skill Enhancement Course– I (SEC)	Introduction to MS-Office (P)	22UCO4SEC1P	2	2	3	40	60	100
Extra Credit Course			Swayam Online Course	As per UGC Recommendations						
	Total				30	25				800

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO4CC7	BUSINESS STATISTICS	CORE	5	5

Course Objectives

- To understand the basic concepts of statistics in relation to business environment.
- To compute measures of location of variation and its relative measures.
- To construct and interpret the index numbers.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the basic concepts of statistics.	K1
CO2	Explain and apply the logic and methodology for calculation of various index numbers, time series, measure of central tendency and dispersion.	K2, K3
CO3	Apply laws of probability which helps to make sense of uncertainties and examine the cause accruing when price level changes.	K3, K4
CO4	Identify and analyze the linear relationship between the variables through correlation and regression.	K3, K4
CO5	Analyze the time series, price and quantity index numbers.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	2	2	2	2
CO2	3	3	2	3	3	3	3	2	2	2
CO3	3	3	2	3	3	3	3	2	2	2
CO4	3	3	2	3	3	3	3	2	2	2
CO5	3	3	2	3	3	3	3	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Statistics: Meaning, Definition, Importance, Scope, Limitations and Distrust of statistics – Measures of Central. Tendency and Dispersion: Mean, Median, Mode, Quartiles. Standard Deviation and Co-efficient of variation. Skewness and Kurtosis.	21	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
II	Correlation – Karl Pearson's Co-efficient of Correlation – Spearman's Rank Correlation of co-efficient – Regression – Properties of Regression co-efficient, Co-efficient of determination.	15	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
III	Probability – Concepts of probability – Application of addition and multiplication theorems – Conditional probability – Baye's theorem (no proof, simple problems and business applications only)	15	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
IV	Index Numbers – Definition, Simple Index Number and Weighted Index Number: Laspeyres's -Paasche's- Fisher's -Marshal Edge-worth -Bowley's - Kelly's formula. Mathematical test of consistency: Time reversal test, Factor reversal test – Fixed index number – Chain index number – Cost of living index.	12	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
V	Elements of Time Series – Secular trend: Graphic method, Method of Semi-Averages, Method of moving averages, Method of least squares. Seasonal Fluctuations: Method of simple averages, Method of moving averages, Ratio to trend method, Method of link relatives, Cyclical fluctuations, Random fluctuations.	12	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
VI	Self-Study for Enrichment (Not to be included for External Examination) Sampling – Methods – Collection of data – Tabulation of data – Diagrammatic representation of Data.	-	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4

Distribution of Marks: Theory 25% & Problem 75%

Text Books

1. Gupta S.P. (2022). *Statistical Methods*. 46th Edition, Sultan Chand & Sons.
2. Navanitham P A. (2022). *Business Statistics*. Reprint, Jai Publishers.
3. Vittal P.R. (2020). *Business Statistics*. Reprint, Margham Publications.

Reference Books

1. Gupta S.C. (2018). *Fundamentals of Statistics*. 7th Edition, Himalaya Publishing House.
2. Jani P.N. (2017). *Business Statistics Theory and Applications*, Reprint, PHIPvt., Ltd.
3. Sharma J.K. (2018). *Business Statistics*. 5th Edition, Vikas Publishing House Pvt., Ltd.

Web Reference

1. <https://www.geeksforgeeks.org/introduction-of-statistics-and-its-types/>
2. <https://www.bmj.com/about-bmj/resources-readers/publications/statistics-square-one/11-correlation-and-regression>
3. <https://www.cuemath.com/data/probability/>
4. <https://www.tableau.com/learn/articles/time-series-analysis>
5. <https://www.geeksforgeeks.org/index-number-meaning-characteristics-uses-and-limitations/>

Pedagogy

Chalk and Talk, Powerpoint Presentation, Discussion, Assignment, Quiz and Seminar.

Course Designer

Ms. J. Lalithambigai.

Semester IV	Internal Marks: 40	External Marks: 60		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO4CC1P	ACCOUNTING PACKAGE (P)	CORE PRACTICAL	5	5

Course Objectives

- To enable the students to learn basic concepts of accounting packages.
- To impart knowledge about Goods and Services Tax.
- To access the applications of accounting by using Tally ERP 9.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the basic concepts of manual accounting.	K1
CO2	Explain the procedure for creating a company.	K2
CO3	Apply the accounting procedures for Ledger creation, Accounting Vouchers and Cost centre.	K3
CO4	Analyse stock group, stock category, stock item and compare stock category summary with godown summary.	K4
CO5	Assess the Estimate of the budget calculation.	K5

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	2	3	2	2	2
CO2	2	2	3	2	2	3	2	2	2	2
CO3	2	3	3	3	2	2	2	2	2	2
CO4	2	3	3	3	2	2	3	2	2	2
CO5	3	3	2	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Accounting Packages – Features – Introduction to Tally – Features of Tally –Creation – Alteration and Deletion of Company – Accounting Features – Accounting Groups – User defined groups –Ledger creation, alteration and deletion–Final Accounts and Balance Sheet.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4,K5
II	Accounting Vouchers - Various types of Accounting Vouchers–Voucher entries–Extraction of Day book and Trial balance–Cost centres–Cost categories– Cost centre.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4,K5
III	Budget creation and alteration – Variance analysis – Payroll preparation – Statutory features – Voucher entries.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4,K5
IV	Inventory Masters: Creation, Alteration and Deletion of Stock Groups, Stock Categories, Units of Measures, Godowns and Stock items – Inventory Features – Entries in Accounting and Inventory Vouchers using stock items.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4,K5
V	Introduction and enabling GST in Tally-Recording GST transactions-Accounting intrastate supply of goods and service - Accounting interstate supply of goods and service- Purchase and Sales Returns of goods and service.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4,K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Financial Reports: Trial Balance – Profit and Loss – Balance Sheet – Working Capital – Cash Flow and Fund Flow Statement – Bank Reconciliation Statement – Stock Summary.		CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4,K5

List of Practicals

1. Creation, alteration and deletion of companies and user defined accounting groups.
2. Creation, alteration and deletion of ledger.
3. Preparation of final accounts and balance sheet preparation.
4. Voucher entries in double entry mode.
5. Voucher entries using cost centers and cost categories.
6. Creation and alteration of budgets and variance analysis.
7. Creation, alteration and deletion of inventory masters.
8. Order processing and voucher entries using accounting and inventory vouchers.
9. Generating Accounting and Inventory Reports.
10. Enabling GST in tally, Recording GST.

Text Books

1. Vishnu P. Singh. (2021). *Tally ERP 9 with GST*, Revised Edition, Sultan Chand & Sons.
2. Srinivasa vallabhan.V. (2020). *Computer Applications in business*, Revised Edition Sultan Chand & Sons.
3. Mohan Kumar K, Rajkumar S. (2019). *Computer applications in business*, Revised Edition. Tata McGraw Hill Education.

Reference Books

1. Parag Joshi.(2017). *Tally ERP 9 with GST*. Revised Edition. Dnyansankul Prakashan.
2. Nadhani.A.K. (2019). *Implementing Tally*, Revised Edition. BPB Publications.
3. Sanjay Satapathy. (2018). *Tally ERP 9 book*. Revised Edition. Advanced usages.

Web Reference

1. <https://gstcentre.in/gst-in-tally-erp-9.php#collapseOne>
2. <http://www.tallysolutions.com>
3. https://help.tallysolutions.com/docs/te9rel66/Job_Work/#gref
4. <https://www.tallyofficialbooks.com/>
5. <https://ncsmindia.com/wp-content/uploads/2012/04/TALLY-9.0-PDF.pdf>.

Pedagogy

Lecture, Power Point Presentation, Lab Demonstration, Group Discussion, Quiz, Assignment and Activity.

Course Designer

Dr. A.Vinodhini

Semester IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO4AC4	E-COMMERCE AND WEB DESIGNING	ALLIED	4	3

Course Objective

- To acquaint the basic concepts of e-commerce and web design.
- To identify, define and differentiate the various modes of electronic commerce.
- To facilitate the students to know the importance of SEO and to build e-commerce applications based on security guidelines.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	List out the technological changes in trade.	K1
CO2	Demonstrate awareness of usability, website design and network issues.	K2
CO3	Explain e-commerce in business models and make use of e-commerce strategies.	K2, K3
CO4	Interpret the various terminologies of electronic commerce and analyze information searching methods, resource discovery and information retrieval techniques.	K3, K4
CO5	Examine the effectiveness of a web design with respect to security measures.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	2	2	3	2	3	3
CO2	3	3	2	3	3	3	3	2	3	3
CO3	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	2	3	3
CO5	3	3	3	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Electronic Commerce – Introduction – Business Models of e-Commerce - B2B e-commerce and EDI – Business Applications of e-commerce. Infrastructure for e-commerce – Communication networks for e-commerce.	12	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
II	Network Services – Secure messaging – Payment systems in e-commerce – Structured electronic documents. e-online Banking: Introduction Concepts and Meaning - Need for computerization - Electronic delivery channels - e-Cheque - Financial Transactions Terminals - MICR Cheques - e-Banking in India. Android Applications – Introduction - Concept - Applications. V-Commerce: Introduction and Features.	12	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
III	Search Engine Optimization (SEO) - Introduction - Importance of SEO - How search Engines Operate - Crawling Techniques - Basic types of search tools - Page rank - Anatomy of hyperlink - Keywords and Queries - Site structure importance - On page optimization vs. off page optimization - Critical components of optimizing a site - Information architecture.	12	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
IV	Webhost – Types – VPS - Domain for a website - DNS Information - Webhost: Bandwidth - Control Panels – Statistics – Uptime - Ecommerce. Website Design: Introduction - Role of Website in B2C. E-commerce - Website strategies and Goals - Website Specification - Design principles - Push and pull approaches - E-mail- E-mail Etiquette- E-mail Security - Online Marketing and promotion.	12	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
V	E-Commerce Technology – Security issues in e-Commerce – Legal and ethical issues - Role of social media in e-Commerce industry - M-Commerce and WAP - Mobile	12	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4

	Commerce Risk, Security and Payment Methods - Mobile money-infrastructure and fraud prevention for M-payment - Current Trends in electronic world – e-Waste – e-Surveillance – e-Governance - e-Care.			
VI	Self-Study for Enrichment (Not to be included for External Examination) Introduction to computers- Importance - Computer Applications in various Areas of Business- General Application of Computers in Various Fields. Classification of Computers- Basic Principles of operation of Digital Computer-Computer system-computer virus- Development of computers and Computer Generation- Computer Number System.	-	CO1, CO2,CO3,C04,CO5	K1, K2, K3,K4,

Text Books

1. Rajaraman V. (2021). *Essentials of E-Commerce Technology*. Revised Edition, PHI Learning Pvt. Ltd.
2. Joseph P.T. (2019). *E-Commerce -An Indian Perspective*. 6th Edition, PHI Learning Pvt. Ltd.
3. Pandey U.S. & Saurabh Shukla. (2019). *E-Commerce and Mobile Commerce Technologies*. Revised Edition, S.Chand.

Reference Books

1. Rayudu C.S. (2016). *E-Commerce, E-Business*. 4th Edition, Himalaya Publishing House.
2. Murthy C.S.V. (2021). *e-Commerce*, Reprint, Himalaya Publishing House.
3. Schneider Gary P. (2020). *e-Commerce: Strategy, Technology and Implementation*., Cengage Learning.

Web Reference

1. https://www.tutorialspoint.com/e_commerce/e_commerce_business_models.htm
2. <https://www.techtarget.com/whatis/definition/search-engine-optimization-SEO>
3. <https://www.tutorialspoint.com/e-commerce-and-security-threats-to-e-commerce>
4. <https://www.ionos.com/digitalguide/e-mail/e-mail-marketing/e-mail-etiquette-rules-for-the-perfect-e-mail/>
5. <https://openstax.org/books/principles-marketing/pages/16-4-ethical-issues-in-digital-marketing-and-social-media>

Pedagogy

Chalk and Talk, Powerpoint Presentation, Discussion, Assignment, Demo by e-Content tutorials, Quiz and Seminar.

Course Designer

Ms. J. Lalithambigai.

Semester IV	Internal Marks:25 External Marks: 75			
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO4GEC2	ADVERTISEMENT MANAGEMENT	GENERIC ELECTIVE	2	2

Course Objectives

- To know the basic marketing communication and the processes.
- To understand the process involved in personal selling and its implications for relationship development.
- To comprehend the ethical issues and social aspects of advertising

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the conceptual framework of advertising.	K1
CO2	Explain the function of Advertising Agencies.	K2
CO3	Identify the formulation of advertising through effective marketing Strategy to promote the product and service for economic development.	K3
CO4	Apply the principles of advertising layout and campaign.	K3
CO5	Analyze the ethical issues and social aspects of advertising.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3	3	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	2	3	3	3	3	3	3	3	3
CO4	3	3	2	2	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Advertising: Advertising– Definition- Objectives – Scope - Types – Role and Significance – Advertising an element of marketing mix– Communication process in advertising.	6	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Technological Aspects: Advertisement Message, Themes, Appeal, Structure, Copywriting and Layout. DAGMAR approach- Determination of target audience–Building of advertising programme–Message – Headlines – Copy – Logo –illustration- Appeal and Layout.	6	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
III	Advertising Media: Media planning-Electronic media- Buying advertising aids-Trademarks- Slogans - Packaging- Pop-up displays – Premiums- Free samples.	6	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
IV	Advertising Agencies: Meaning and Definition- Service Rendered by an Ad Agency - Agency Selection Criterion - Agency Accreditation - Agency Client Relationship - Organization Structure of an Advertising Agency - Changing of Advertising Agency - Career Options in Advertising.	6	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
V	Advertising in India: Role of Advertising in modern business-Economic, Social and Ethical aspects of advertising - Advertising goals– Recent developments and Issues in advertising. Advertising Standard Council of India (ASCI) - Techniques for measuring advertising effectiveness.	6	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
VI	Self-Study for Enrichment (Not to be included for External Examination). Difference between National Advertising and Retail Advertising-Film Advertising - Purchase Point Advertising-Media Vehicle choice-Media Survey-Marketing through Social Sites- Ethics in Advertising.		CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4

Text Books

1. Sunil KR. (2023). *Advertisement Management*. Revised Edition. Kindle.
2. Saravanavel.P, Sumathi.S. (2017). *Advertising and salesmanship*. Revised Edition. Margham Publication
3. Gupta.S.L ,Ratna.V.V. (2011). *Advertising and Sales Promotion Management*. An IndianperspectiveTextandCases. Sultan Chand & Sons. NewDelhi

Reference Books

1. Ruchi. G. (2012). *Advertising Principles & Practice*. Revised Edition. S.Chand& CompanyLtd,Delhi
2. Dr.AnsuyaAngadi. (2010). *Advertising & Sales Management*. Sri SiddalingeshwaraPrakashana. Gulbarga.
3. George E. Belch & Michael A belch.(2014). *Advertising & Promotion*. Revised Edition. McGraw Hill Publishing.

Web Reference

1. <https://business.linkedin.com/marketing-solutions>
2. <https://www.vedantu.com/commerce>.
3. <https://www.easymanagementnotes.com/advertising-study-material/>
4. <https://www.studocu.com/in>
5. <https://byjus.com/>

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar, Group Discussions, Experience Discussion & Activity.

Course Designer

Ms.B.Lavanya

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO4SEC1P	INTRODUCTION TO MS-OFFICE (P)	SKILL ENHANCEMENT	2	2

Course Objectives

- To acquire and apply the computer applications in different aspects of business.
- To get insight knowledge on MS-Word, MS-Excel and Powerpoint.
- To know the database maintenance in every type of application using MS-Access.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the basic concepts of computer applications.	K1
CO2	Demonstrate a presentation slide using PowerPoint tools.	K2
CO3	Develop Word documents using Word package tools.	K3
CO4	Build worksheets using various statistical tools to analyse business transactions.	K3, K4
CO5	Construct a new database with related tables and examine database concepts.	K3, K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	2	2	3	3	2	2	3
CO2	2	3	2	3	3	2	2	2	2	2
CO3	2	3	2	3	3	2	2	2	2	2
CO4	2	3	3	3	3	2	2	2	2	2
CO5	2	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Computer Definition - Characteristics and Limitations of Computer - Generations of Computer, Primary and Secondary Memories - Input and Output Devices - Operating System- Function of Operating System- Types of Operating System.	4	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
II	Word Processing: Features - Advantages and Applications - Parts of Word Window Toolbar - Creating, Saving, Closing, Opening and Editing of a Document - Moving and Coping a Text -Formatting of Text and Paragraph - Bullets and Numbering - Find and Replace - Insertion of objects - Headers and Footers - Page Formatting - Auto Correct Spelling and Grammar - Mail Merge – Macros.	8	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
III	Spread Sheet: Features - Workbook – Cell - Parts of a window - Saving, Closing, Opening of a Work Book – Editing – Advantages – Formulas - Types of Function -Templates – Macros – Sorting - Charts – Filtering.	6	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
IV	PowerPoint: Introduction – Starting – Parts - Creating of Tables - Create Presentation – Templates Auto Content Wizard - Slide Show - Editing of Presentation - Inserting Objects and charts.	6	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
V	Orientation to Microsoft Access : Create a Simple Access Database - Working with Table Data - Modify Table Data - Sort and Filter Records - Querying a Database - Create Basic Queries - Sort and Filter Data in a Query - Perform Calculations in a Query - Create Basic Access Forms - Work with Data on Access Forms - Create a Report - Add Controls to a Report - Format Reports.	6	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4
VI	Self-Study for Enrichment (Not to be included for External Examination) Classification of Computers, Applications of Computer, Basic Components of PC, Computer Architecture -Languages and its Types.	-	CO1, CO2,CO3,C O4,CO5	K1, K2, K3,K4

List of Practicals

1. Prepare a Class Time Table and perform the following operations: Inserting the table, Data Entry, Alignment of Rows and Columns, Inserting and Deleting the Rows and Columns and Change of Table Format.
2. Prepare a Shareholders meeting letter for 10 members using mail merge operation.
3. Prepare Bio-Data by using Wizard/Templates.
4. Prepare a mark statement (minimum of 5 subjects) and perform the following operations: Data Entry, Total, Average, Result and Ranking by using arithmetic and logical functions and sorting.
5. Draw the different type of charts (Line, Pie, Bar) to illustrate year-wise performance of sales, purchase, profit of a company by using chart wizard.
6. Prepare a statement of Bank customers account showing simple and compound interest calculations for 10 different customers using mathematical and logical functions.
7. Design presentation slides using animation Effects and perform the following operations: Creation of different slides, changing background colour, font colour using word art.
8. Prepare a payroll for employee database of an organization with the following Details: Employee id, Employee name, Date of Birth, Department and Designation, Date of appointment, Basic pay, Dearness Allowance, House Rent Allowance and other deductions if any. Perform queries for different categories.

Text Books

1. Bittu Kumar (2017). *Mastering MS Office*. Revised Edition, V & S Publishers.
2. LokeshLalwani (2019). *Excel 2019*. 1st Edition, BPB Publications.
3. Wallace Wang. (2018). *Microsoft Office 2019*. Wiley Publications.

Reference Books

1. Michale Price(2019). *Office 2019*.BPB Publications.
2. Kevin Pitch(2022). *PowerPoint*,Career Office Elevator, Kindle Edition.
3. Kevin Pitch (2022). *Microsoft Word*,Career Office Elevator, Kindle Edition.

Web Reference

1. <https://support.office.com/en-us/office-training-center>
2. <https://www.skillshare.com/browse/microsoft-office>
3. https://www.tutorialspoint.com/computer_fundamentals/index.htm
4. <https://edu.gcfglobal.org/en/subjects/office/>
5. <https://www.microsoft.com/en-us/learning/training.aspx>

Pedagogy

Lab Demonstration and Powerpoint Presentation.

Course Designer

Ms. J. Lalithambigai.

B.Com
(2022-2023)
V Semester



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
PG & RESEARCH DEPARTMENT OF COMMERCE
B.Com.– PROGRAMME STRUCTURE
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the candidates admitted from the academic year 2022 – 2023 onwards)

V Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
V	III	Core Course –VIII (CC)	Corporate Accounting	22UCO5CC8	6	6	3	25	75	100
		Core Course - IX (CC)	Financial Management	22UCO5CC9	5	5	3	25	75	100
		Core Course - X (CC)	Entrepreneurship and Small Business Management	22UCO5CC10	5	5	3	25	75	100
		Core Practical –II (CP)	SPSS (P)	22UCO5CC2P	5	5	3	40	60	100
		Discipline Specific Elective – I (DSE)	A. Human Resource Management	22UCO5DSE1A	5	4	3	25	75	100
			B. Marketing Research	22UCO5DSE1B						
			C. Industrial Relations and Labour Law	22UCO5DSE1C						
	IV	Ability Enhancement Compulsory Course-IV (AECC)	UGC JeevanKaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course– II (SEC)	Skills for Competitive Examination	22UCO5SEC2	2	2	3	-	100	100
		Extra Credit Course	Swayam Online Course	As per UGC Recommendations						
		Total				30	29			700

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO5CC8	CORPORATE ACCOUNTING	CORE	6	6

Course Objectives

- To understand various adjustments related to share capital.
- To help the students to acquire conceptual knowledge of the fundamentals of the corporate accounting and the techniques of preparing the financial statements.
- To know the provisions of the Company Act and to build accountability in corporate sector.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the conceptual background of Company Accounts.	K1
CO2	Explain the concepts and techniques on the issue and redemption of Debentures.	K2
CO3	Build knowledge on value of goodwill and shares of business firm.	K3
CO4	Apply and Examine with the legal formats, special items and adjustments pertaining to Banking companies.	K3,K4
CO5	Analyze the accounts of Holding Company.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	2	2	3	2	3	3	3	3
CO3	3	2	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation
“3”–Substantial (High) Correlation“-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Accounting for Share Capital - Issue of shares: Par, Premium and Discount - Forfeiture and Reissue of Shares - Issue of right and bonus shares.	18	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Redemptions of Preference Shares- Issue and Redemption of debentures: Accounting Treatment for Debentures - Issued at Par ,Discount and Premium - Repayable at par and premium.	18	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
III	Valuation of Goodwill and Shares – Need and Methods –Valuation of Goodwill: Average Profit Method, Super Profits Method , Capitalization Method and Annuity Method. Valuation of Shares : Net Asset Method, Yield Method and Fair Value Method.	18	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
IV	Accounts of Holding Companies – Steps involved inthe preparation of Consolidated Balance Sheet (excluding Inter Company Holdings).	18	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
V	Accounts of Banking Companies (new format) - Preparation of Profit and Loss Account – Balance Sheet.	18	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4
VI	Self-Study for Enrichment (Not to be included for External Examination). Company Final Accounts- Provisions of the Companies Act, 2013.		CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4

Distribution of Marks: Theory 20%and Problems 80%

Text Books

1. Reddy. T S, MurthyA, (2023). *Corporate Accounting*. Margham Publications.
2. S.P. Jain, K.L. Narang (2017). *Corporate Accounting*. Kalyani Publishers.
3. Tulsain, P.C:(2023). *Corporate Accounting*, S. Chand Publication. New Delhi.

Reference Books

1. Maheshwari S.N (2018). *Corporate Accountancy*. Vikas Publishing House, New Delhi.
2. Gupta. R L, Radhasamy M, (2021). *Corporate Accounting*. Sultan Chand & Sons.
3. M.C.Shukla, T.S.Grewal (2016). *Advanced Accountancy*. Sultan Chand & Sons.

Web Reference

1. <https://www.gacwrmd.in/learning/Commerce/Corporate%20Accounting1.pdf>
2. <https://www.icsi.edu/media/webmodules/Corporate%20and%20Management%20Accounting.pdf>.
3. <https://testbook.com/objective-questions/mcq-on-corporate-accounting--5f9168bba03904a227ce6338>
4. https://ddceutkal.ac.in/Downloads/UG_SLM/Commerce/Corporate_Accounting.pdf
5. <https://www.drnishikantjha.com/booksCollection/Corporate%20Accounting%20.pdf>

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar, Group Discussions & Activity.

Course Designer

Dr. P. Banu

Semester V	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO5CC9	FINANCIAL MANAGEMENT	CORE	5	5

Course Objectives

- To provide an in-depth understanding of the link between company decision-making and financial management concepts.
- To understand the financial plans, proposals, and results.
- To apply the various tools to make financial decisions.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define and explain the functions of finance, the time value of money, and financial statements.	K1, K2
CO2	Outline the objectives of financial management and understand working capital management to ensure adequate working capital for business functions.	K2
CO3	Identify the capital structure and dividend policy decisions through relevant models.	K3
CO4	Analyse the financial plan on the basis of the cost of capital and acquire a deep knowledge of leverage in order to arrive at a better financial decision.	K4
CO5	Examine the factors affecting investment decisions and opportunities presented to an organization.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	3	3	2	3	3	3	3	2
CO3	3	3	2	3	3	3	3	3	3	3
CO4	3	3	2	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation
“3” – Substantial (High) Correlation – “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Meaning, objectives and importance of finance – Sources of finance – Functions of financial management – Role of financial manager in financial management - Time value of money - Present value and Compound value.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Cost of Capital – Features – Importance – Classification of cost of capital - Cost of Debt - Cost of Preference Share Capital - Cost of Equity - Cost of Retained Earnings - Weighted Average Cost of Capital.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
III	Capital Structure – Meaning – Capital Structure and financial structure– Factors affecting capital structure – Determining debt and equity proportion – Theories of capital structure – Leverage – Significance - Operating leverage, Financial leverage and Composite leverage.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
IV	Working capital – Components of working capital – Working Capital Operating Cycle –Determinants of working capital requirement Dividend policies – Factors affecting dividend payment – Company law provisions on dividend payment – Theories (Walter’s, Gordon’s and M.M. Approach) – Relevance of Dividend and irrelevance of Dividend.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
V	Receivables management –Meaning- Objectives, factors – Cost of maintaining receivables- Credit policy - Credit standard - Credit term - Collection policy.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
VI	Self-Study for Enrichment (Not to be included for External Examination) Cash Management – Financial Planning.		CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4

Distribution of Marks: Theory 20% and Problem 80%

Text Books

1. Khan & Jain.(2018).*Financial Management*. 8th Revised Edition. Tata McGraw Hill.
2. Maheshwari S.N (2019).*Financial Management*. 12th Revised Edition. Sultan Chand & Sons.
3. Pandey I.M (2016). *Financial Management*. 11th Revised Edition. Vikas Publishing House. Chennai.

Reference Books

1. Dr. A. Murthy (2018). *Financial Management*. 1st Edition Revised and reprinted. Margham Publications.
2. Shashi K Gupta, R.K. Sharma (2020). *Financial Management*. 12th Revised Edition. Kalyani Publications.
3. Prasanna Chandra (2019). *Financial Management*. 10th Revised Edition. Tata McGraw Hill.

Web Reference

1. <https://www.netsuite.com/portal/resource/articles/financial-management/financial-management.shtml>
2. <https://www.investopedia.com/terms/c/costofcapital.asp>
3. <https://universe.bits-pilani.ac.in/uploads/Leverage%20and%20capital%20structure.pdf>
4. <https://www.investopedia.com/terms/w/workingcapitalmanagement.asp>
5. <https://www.meruaccounting.com/blog/receivable-management-meaning-objectives-importance/>

Pedagogy

Chalk and talk, Power Point Presentation, Assignment, Seminar and Quiz

Course Designer

Dr. D. Sarala.

Semester V	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO5CC10	ENTREPRENEURSHIP AND SMALL BUSINESS MANAGEMENT	CORE	5	5

Course Objectives

- To enrich the students towards the knowledge of entrepreneurial skills.
- To understand the approaches to attain the goals of the business.
- To describe the challenges of entrepreneurship especially for a small business.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the basic concepts of Entrepreneurship Development.	K1
CO2	Outline a business plan that can be used to run a new small business enterprise.	K2
CO3	Identify the funding agencies and various financial institutions involved in the development of SSI.	K3
CO4	Examine the role of Government in organizing Entrepreneurship Development Programme.	K4
CO5	Analyze the sources and techniques of entrepreneurial ideas.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3	3	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	2	3	3	3	3	3	3	3	3
CO4	3	3	2	2	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation
 “3” – Substantial (High) Correlation “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Entrepreneurship: Meaning - Evolution of the concept - Functions - Types – Qualities– Concept - Development of Entrepreneurship - Entrepreneurial Culture - Stages in entrepreneurial process - Factors influencing Entrepreneurship – Women Entrepreneurs – Rural Entrepreneur.	15	CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4
II	MSME's and Support Institutions:Definition - Importance of MSME for Economic Growth - Role of Government Organizations in Entrepreneurship Development - DIC – Khadi and Village Industries Commission – NSIC – NABARD, SICVI, SFC, SDC, EDII, EPCCB - Government Schemes – Industrial Estates – Prime Minister Employment Generation Programme.	15	CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4
III	Development of Business Ideas :Ideas in Entrepreneurships – Sources of New Ideas – Techniques for generating ideas – Opportunity Recognition – Steps in tapping opportunities.	15	CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4
IV	Entrepreneurial Development Programme (EDP) – Role, relevance and achievements – Role of Government in organizing EDPs - Critical evaluation.	15	CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4
V	Formulation of Project Report:Preparation of Project Report –Content; Guidelines for Report preparation – Project Appraisal techniques — Steps. Analysis: Financial, Market and Technical Feasibility.	15	CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4
VI	Self Study for Enrichment (Note be included for End Semester Examination). Geographical Challenges - Historical Attributes to Business - Country Topographical Features - New Business Formation - Current Market Trends - Decision Making Skills.		CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4

Text Books

1. C.B.Gupta, Srinivasan.(2022).*Entrepreneurial Development*.Revised Edition. Sultan Chand and Sons.
2. Prasanna Chandra, (2017).*Projects- Planning , Analysis. Financing , Implementation and review*. 8 th edition. Tata Mcgraw Hill Publishing Company Ltd. New Delhi
3. Dr.S.S. Khanka-(2020). *Entrepreneurial Development*.Revised Edition. Sultan Chand and Sons.

Reference Books

1. Kolb Bonita M (2015). *Entrepreneurship for the creative and cultural industries*. Revised Edition. Routedge.
2. Saravanavel (2015). *Entrepreneurial Development*. Revised Edition. Himalaya Publications.
3. C.S.V. Murthy (2015)..*Entrepreneurial Development*.Revised Edition. Himalaya Publishing House.

Web Reference

1. <https://www.pasc.edu.in/wp-content/uploads/2021/04/ENTREPRENEURSHIP-DEVELOPMENT>
2. <https://www.vedantu.com/commerce/entrepreneurship-development-process>
3. <https://www.hhrc.ac.in/ePortal/Commerce/I%20M.Com.%20-%2018PCO1%20-%20Dr.%20R.%20Sathru%20Sangara%20Velsamy%20&%20Dr.%20P.%20Sailaja.pdf>
4. <https://www.toppr.com/guides/business-studies/entrepreneurship-development/process-of-entrepreneurship-development>
5. https://ddceutkal.ac.in/Syllabus/MCOM/Entrepreneurship_Development.pdf

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar, Group Discussions, Experience Discussion & Activity.

Course Designer

Ms.B.Lavanya

Semester V	Internal Marks: 40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO5CC2P	SPSS(P)	CORE PRACTICAL	5	5

Course Objectives

- To learn the statistical computation skill through SPSS Package.
- To develop an ability to analyze and interpret the data with statistical evidences.
- To apply the demonstrated knowledge in the field of research.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the basic concepts of statistics	K1
CO2	Explain the significance of data analysis by preparing a concise report.	K2
CO3	Apply and practice data coding, measurement and editing.	K3
CO4	Test for reliability of the data.	K4
CO5	Value the concepts of parametric and non parametric tests and perform statistical analysis that can test hypotheses.	K5

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	2	3	2	2	2	2
CO2	2	3	2	3	3	3	3	2	2	2
CO3	2	3	2	3	3	2	3	3	2	2
CO4	2	3	3	3	3	2	3	3	3	3
CO5	2	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Sampling and Data Collection – Methods of Data Collection – Primary and Secondary Data - Data Coding in SPSS - Entering and Editing Data - Characteristics of Variables - Type of Scale of Measurements, Choosing appropriate scale and measurement to the data - Adding Value, Labels, Grouping Data - Transforming Variables.	15	CO1,CO2, CO3, CO4 CO5	K1,K2, K3,K4
II	Reliability of Data – Selection of Tools for Analysis Introduction to Hypothesis Testing – Hypothesis Testing Procedure Frequencies Table – Percentages Analysis – Mean – Median – Mode – Charts - Bar Charts, Histograms, PieCharts.	15	CO1,CO2, CO3, CO4 CO5	K1,K2, K3,K4
III	Parametric Test: Students ‘T’ test, ANOVA – Non – Parametric Test: One Sample Tests, Chi Square Test, Man – Whitney–K–related Test, K–Sample related test.	15	CO1, CO2, CO3, CO4 CO5	K1,K2, K3,K4
IV	Correlation: Pearson product moment Correlation - Spearman Rank Correlation - Partial Correlation - Simple linear Regression - overall significance variable selection methods.	15	CO1, CO2, CO3, CO4 CO5	K1,K2, K3,K4
V	Report writing and Presentation – Steps in Report writing –Types of reports – Substance of Reports – Formats of Reports – Presentation of a Report – Documentation.	15	CO1, CO2, CO3, CO4 CO5	K1,K2, K3,K4
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Boxplots - Cluster Bar and Charts Scatter Diagrams; Two Samples Test - Two Sample Median Test - U Test Multiple Linear Regression - Assumptions - Foot Note – Bibliography.			

List of Practicals

- Questionnaire Framing
- Data Collection and Data Reliability
- Frequency Analysis
- Preparation of Charts
- Mean, Median and Mode
- “T” Test
- ANOVA
- Chi-Square Test
- Correlation
- Regression
- Report Writing

Text Book

1. Dr. Lalit Prasad, Dr. Priyanka Mishra, (2022). *DATA ANALYSIS USING SPSS: Text and Cases, For Researchers, Teachers and Students*, Revised Edition. Nirali Prakashan advancement of knowledge.
2. Pandian Sundara P, Muthulakshmi S, Vijayakumar T. (2022). *Research methodology & Applications of SPSS in Social Science Research*. Revised Edition, Sultan Chand & Sons.
3. Kalyanaraman K., Hareesh N. Ramanathan, Harikumar P.N., (2021). *Statistical Methods for Research: A Step-by-Step Approach Using IBM SPSS*. Revised Edition, Atlantic.

References Book

1. Darren George, Paul Mallery. (2021). *IBM SPSS Statistics 27 Step by Step: A Simple Guide and Reference*. Seventeenth Edition, Routledge.
2. David Kremelberg, (2020). *Practical Statistics: A Quick and Easy Guide to IBM® SPSS® Statistics, STATA, and Other Statistical Software*. Revised Edition, SAGE Publications, Inc.

Web References

1. https://www.academia.dk/BiologiskAntropologi/Epidemiologi/PDF/SPSS_Statistical_Analyses_using_SPSS.pdf
2. https://www.ibm.com/docs/en/SSLVMB_28.0.0/pdf/IBM_SPSS_Statistics_Brief_Guide.pdf
3. https://students.shu.ac.uk/lits/it/documents/pdf/analysing_data_using_spss.pdf
4. <http://repo.darmajaya.ac.id/5678/1/Discovering%20Statistics%20Using%20IBM%20SPSS%20Statistics%20%28%20PDFDrive%20%29.pdf>

Course Designer

Dr.S.J.Sureya

SemesterV	Internal Marks:25		External Marks:75	
COURSECODE	COURSE TITLE	CATEGORY	HOURS /WEEK	CREDITS
22UCO5DSE1A	HUMAN RESOURCE MANAGEMENT	CORE	5	4

Course Objectives

- To familiarize the students with concepts and principles of Human Resource Management.
- To understand the Human Resource Management System at various levels.
- To develop relevant skills necessary for application in Human Resource related issues.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the basic concepts, functions and processes of HRM.	K1
CO2	Summarize the steps for recruitment and selection.	K2
CO3	Apply the procedures for performance appraisal and fixation of compensation.	K3
CO4	Identify and analyse the various ways and methods of developing, maintaining and Integrating human resources.	K3,K4
CO5	Explain the Human Resource Management in a Changing Environment.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	2	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3

“1”–Slight(Low)Correlation □ “2”–Moderate(Medium)Correlation □
“3”–Substantial(High)Correlation □ “-”indicates there is no correlation.

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	HRM Introduction – Characteristics – Scope – Objectives – Importance and Functions of HRM - Qualities - Role of Human Resource Manager – Human Resource Planning – Concept – Objective - Importance - Process - Levels - Problems - Guidelines for effective Human Resource Planning.	15	CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4
II	Job analysis – Meaning – Objectives – Advantages – Process – Techniques – Job Specification – Recruitment – Meaning – Methods – Selection – Concept – Steps in Selection Process – Problem involved in Placement. Induction – Meaning – Objective and Purpose of Induction.	15	CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4
III	Training- Need for training - Benefits of training- Identification of training needs and methods of training. Human Resource Development - Meaning and Role of training in HRD- Impact of Globalization on Human Resource Management.	15	CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4
IV	Performance Appraisal - Objectives - Methods - Factors affecting performance Appraisal . Job evaluation - Meaning - Methods : Non – quantitative and quantitative.WageandSalaryAdministration-Meaning - Objectives - Factors influencing wages - Different patterns of wage payment – Incentives – Bonus.	15	CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4
V	Human Resource Management in a changing Environment :DownsizingPlan- Exit Policy- National Renewal Fund - Voluntary Retirement Scheme and Sexual Harassment . Ethical Issues in HRM . Emerging Trends in HRM- Changing role of Human Resource Management – Impact of Globalization on HRM.	15	CO1,CO2, CO3,CO4, CO5	K1,K2, K3,K4
	Self-Study for Enrichment Career Planning and Development – Management of Stress – Motivation – Absenteeism and Labour Turnover.			

Text Book

1. C.B.Gupta, (2018). *HumanResourceManagement Text & Cases*. 19th Revised Edition. SultanChand&Sons.
2. R.SubbaRao (2018). *HumanResourceManagement*. Revised Edition. Himalaya Publishing House.
3. C.D. Balaji, (2015). *HumanResourceManagement*. Revised Edition. Margham Publications.

Reference Books

1. Dr.S.S.Khanka (2003). *Human Resource Management Text &Cases*.,Revised Edition. S.Chand.
2. R.S. Dwivedi (2009). *A Textbook of Human Resource Management*. Revised Edition.Vikas Publishing House.
3. 2. V.S.P.Rao (2015). *Human Resource Management*. Revised Edition.Vikas Publishing House.

Web References

1. <https://www.drnishikantjha.com/booksCollection/hrm-basic-notes.pdf>
2. <https://www.rccmindore.com/wp-content/uploads/2020/12/hrm-notes-hons-iii-1.pdf>
3. <https://www.youtube.com/watch?v=anTWkj2yIH8>
4. <https://www.slideshare.net/versatileBschoo/human-resource-management-full-notes>
5. https://oms.bdu.ac.in/ec/admin/contents/86_16MBECM3-16CCCAC12-16MBECA5_2020052103563773.pdf

Pedagogy

ChalkandTalk, Power point presentations, Group Discussion, Seminar, Quiz Assignment.

Course Designer

Dr.J.Praba

Semester V	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO5DSE1B	MARKETING RESEARCH	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives

- To enable the students to understand the concept of marketing research.
- To provide students with research and managerial knowledge, tools and skills for identifying, tackling, judging and using evidence to solve marketing problems in business.
- To Identify marketing problem(s) to assist in decision making.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and explain the concepts about contemporary marketing Research.	K1,K2
CO2	Outline the research process to explain various methods that will be proposed through a marketing research proposal.	K2
CO3	Apply a Research in the marketing area to gather, code analyze and arrange the data.	K3
CO4	Identify and examine the methodologies to acquire evidence in an ethical manner to address the marketing problem.	K3,K4
CO5	Analyze all types of relevant evidence towards finding solutions to the marketing problems.	K4

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	2	3	3
CO2	3	3	2	3	3	3	3	2	3	3
CO3	3	3	2	3	2	3	3	2	3	3
CO4	3	3	2	3	2	3	3	2	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Marketing Research Definition – Concepts and Objectives – Advantages and Limitations of Marketing Research - Problems and Precautions in Research – Analysing competition and Consumer Market – Market Research Methodology.	15	CO1,CO2, CO3, CO4 CO5	K1,K2, K3,K4
II	Market Research Proposal – Meaning and Elements of Research Proposal – Marketing Research Design – Concepts – Importance – Types. Hypothesis – Concept – Importance – Types. Sampling – Concepts – Terms in Sampling – Techniques of Sampling – Essential of Good Sampling	15	CO1,CO2, CO3, CO4 CO5	K1,K2, K3,K4
III	Data Collection – Primary Data and Secondary Data – Concept – Merits and Demerits – Methods – Sources. Qualitative and Quantitative Research – Concept – Features – Difference.	15	CO1, CO2, CO3, CO4 CO5	K1,K2, K3,K4
IV	Data Processing – Editing – Meaning – Objectives – Types. Coding – Meaning – Guidelines. Classification – Meaning – Methods. Tabulation – Meaning – Methods. Data Analysis and Interpretation: Data Analysis – Meaning – Steps – Use of Statistical Tools (SPSS, SAS, MS Excel, MINITAB). Data Interpretation – Meaning – Importance – Stages.	15	CO1, CO2, CO3, CO4 CO5	K1,K2, K3,K4
V	Market Research Reports – Presentation – Return Report – Format – Common Problems in Preparing Reports – Critical Nature of the Reports – Graphical Presentation – Ethical Issues in Marketing Research – Ethical Issues Related to Clients, Respondents, Sampling, Questionnaire, Questionnaire Design and Reporting.	15	CO1, CO2, CO3, CO4 CO5	K1,K2, K3,K4

VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Market Trends - Advertising research – Rural marketing research – Consumer and Product research.		CO1, CO2, CO3, CO4 CO5	K1,K2, K3,K4

Text Book

1. Naresh K Malhotra, (2019). *Marketing Research: An Applied Orientation*. 7th Edition. Pearson Education. Asia.
2. Paul E. Green, Donald S. Tull. (2009). *Research for Marketing Decisions*. 5th Edition. PHI Learning Private Limited. New Delhi.
3. S.K Gupta, PraneetRangi, (2014). *Marketing Research*. Revised Edition. Kalyani publishers.

References Book

1. Donald R. Cooper, Schindler,(2016). *Marketing Research Concept & Cases*. Tata McGraw – Hill Publishing Company Limited.2006
2. Dr.Prabha Deena, Sridevi M,(2019). *Marketing Research and Metrics*, Revised Edition. Thakur Publication Private Limited
3. RajendraNargundkar,(2019). *Marketing Research Text and Cases*. 4th Edition. McGraw-hill.

Web References

1. <https://onlinemkt.org/marketing-research/>
2. <https://www.driverresearch.com/market-research-company-blog/7-components-of-a-market-research-proposal/>
3. <https://www.simplilearn.com/what-is-data-collection-article#:~:text=Data%20collection%20is%20the%20process%20of%20collecting%20and%20analyzing%20information,test%20hypotheses%2C%20and%20assess%20results>
4. <https://databox.com/marketing-research-report>
5. <https://www.qualtrics.com/au/experience-management/research/market-research-types/>

Pedagogy

Lecture, Power Point Presentation, Assignment, Seminar, Group Discussions

Course Designer

Ms. N. Aruna

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO5DSE1C	INDUSTRIAL RELATIONS AND LABOUR LAW	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives

- To safeguard workers right, promote trade union activities and make employment more secure.
- To minimise the labour turnover rate and absenteeism.
- To understand the constitutional provisions and industrial relations legislation relating to labour.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the laws relating to industrial relations, labor legislation and social securities.	K1
CO2	Explain various process and procedures of handling employee relations.	K2
CO3	Apply the concepts of industrial disputes, strikes and lockouts with reference to concerned legislations.	K3
CO4	Examine the concept of industrial relation and the role of trade union in the industrial setup.	K4
CO5	Analyze the labour problems in the organization and have better decision-making and conflict resolution skills.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	2	2	3	2	3
CO2	3	3	3	3	3	3	2	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Overview of Industrial Relations - Concept - Nature – Objective – Parties of Industrial Relations.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Trade Unionism - Origin and Growth – Unions After Independence – Concept - Objective – Function – Problems of Trade Union.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
III	Workers Participation in Management - Meaning of Workers Participation in Management – Collective Bargaining, Nature and Methods – ILO and Its role Tripartite Approach in Industrial Relations .	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
IV	Labour legislation - The industrial Relation Code 2019 - An Introduction and Overview of Factories Act: Industrial disputes Act , Payment of Wages Act , Payment of Bonus Act , ESI Act , Payment of Gratuity Act, Minimum Wages Act , PF Act and Workmen’s Compensation Act.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
V	Industrial safety - Meaning – Important - Causes of Accidents – Prevention – Safety Provisions –Industrial Health and Hygiene –Important –Problems- Occupational Hazards Diseases – Psychological Problems – Counselling – Statutory Provisions.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
VI	Self-Study for Enrichment (Not to be included for External Examination) Socio - Economic Background of Indian labour: Economic Problems of Labour - Wages and Standard of Living-Unemployment and Employment - Social Security and State Policy.		CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4

Text Books

1. Sreenivasan, M R, (2015).*Industrial Relations & Labor Legislation*. Revised Edition. Margham Publication Chennai.
2. Nandhakumar.B, (2015).*Industrial Relation Labour Welfare and Labour laws*. Revised Edition. Vijay Nicole imprinters Pvt Ltd. Chennai.
3. VenkataRatnam, C S, (2017), *Industrial Relation*, 2nd edition. Oxford University , New Delhi.

Reference Books

1. Srivastava, S C, (2020).*Industrial Relations and Labour Laws*, 8th edition, Noida Vikas Publishing House Private Limited.
2. Sarma, A M ,(2019). *Industrial Jurisprudence and Labour Legislation*. 9th edition, Himalaya Publishing House. Mumbai.
3. Tripathi, P C Gupta, C P Kapoor, N D (2012).*Industrial Relation Labour Law*. 5th Edition. Sultan Chand. New Delhi.

Web Reference

1. https://baou.edu.in/assets/pdf/PGDHR_201_slm.pdf
2. https://www.mlsu.ac.in/econtents/1185_Industrial%20Relations%20and%20Labour%20Laws.pdf
3. https://www.sultanchandandsons.com/Images/BookImages/EBook/399_ISBN9789351611660.pdf
4. <http://www.mbaexamnotes.com/industrial-relations-and-labour-laws.html>
5. https://www.academia.edu/33220728/BA7034_Industrial_Relations_and_Labour_welfare_A_Course_Material_on

Pedagogy

Lecture, Power Point Presentations, Group Discussion, Seminar, Quiz, Assignment, Experience Discussion, Brain Storming, Activity.

Course Designer

Dr.S.Sudha,

Semester V	Internal Marks: Nil	External Marks: 100		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCO5SEC2	SKILLS FOR COMPETITIVE EXAMINATION	SKILL ENHANCEMENT COURSE	2	2

Course Objectives

- To develop competitive skills through various types of objective tests.
- To train them by conducting aptitude test based on verbal and quantitative skills.
- To motivate the students to prepare for high level competitive exams.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Select prospective career in Government and Corporate Sector	K1
CO2	Outline a sense of awareness and other information about various competitive examinations	K2
CO3	Summarize professional and ethical attitude and choose effective communication skills	K2, K3
CO4	Solve a problem and to identify the appropriate computing requirement	K3
CO5	Take part in the competitive examination.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Coding and Decoding – Puzzles – Seating Arrangement – Logical reasoning – Ranking and Order – Alphanumeric series – Data Sufficiency – Syllogism – Input and Output – Statement, Argument and Assumption – Reasoning Analogy – Reasoning Inequality – Fundamental Arithmetical Operations – Blood Relations.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Simplification and Approximation – Profit & Loss – Number Series – Quadratic Equations – Problems on Ages – Boat and Stream – Speed, Time and Distance – Percentage – Ratio and Proportion – Number System – Simple and Compound interest – Menstruation – Mixture and Allegations – Time and Work – Pipes and Cistern – Problems on Trains.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Data Interpretation (Bar Graph, Line Chart, Tabular, Caselet, Radar/Web, Pie Chart) – Linear Equation – Probability. Cloze Test – Sentence Improvement – Sentence Correction – Para Jumbles – Connectors – Reading Comprehension – Spotting Errors – Spelling Errors – Word Rearrangement – Word Usage – Sentence based Error.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Current Affairs – Banking Awareness – GK Updates, Currencies – Important Places – Books and Authors – Awards – Headquarters, Prime Minister Schemes – Important Days.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	History of Computers – Data Processing Cycle of a Computer – Computer Languages – Input Devices and Output Devices – Operating Systems – Database Management Systems – Microsoft Office – Keyboard Shortcuts – File Extensions – Networking and Internet – Computer Viruses – Important Abbreviations. ICT: General abbreviations and terminology -	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	Basics of Internet, Intranet, E-mail, Audio and Video-conferencing – ICT and Governance.			
VI	Self-Study for Enrichment (Not to be included for External Examination) Basic Computer Knowledge – Computer Fundamentals – Parts of a Computer System – Digital initiatives in higher education – Basic Computer Knowledge	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Dr. R S Aggarwal (2022), *A Modern Approach to Logical Reasoning All Competitive Exams*. S Chand And Company Ltd.
2. M.K. Pandey (2023). *Analytical Reasoning: 5th New Edition*. Bsc Publishing Co. Pvt. Ltd.
3. Dr. R S Aggarwal (2022). *Quantitative Aptitude for Competitive Examinations All Government and Entrance Exams*. S Chand Publishing.

Reference Books

1. Disha (2022). *The Yearly Current Affairs 2023 for Competitive Exams*. 8th edition. Disha Publication.
2. Abhijit Guha (2020). *Quantitative Aptitude for Competitive Examinations*. Seventh edition, McGraw Hill.
3. Oswal (2020). *An Advanced Approach to Verbal & Non-Verbal Reasoning for Competitive Exams*. Oswal Printers & Publishers Pvt. Ltd.

Web Reference

1. <https://www.examsbook.com/reasoning-ability-questions-and-answers>
2. <https://www.javatpoint.com/aptitude/quantitative>
3. <https://www.examsbook.com/general-english-questions-and-answers-for-competitive-exam>
4. <https://www.examsbook.com/gk-questions-on-current-affairs-for-competitive-exams>
5. <https://testbook.com/objective-questions/mcq-on-computer-fundamentals--5fb69dfc1b5c16e438f976f6>

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussion

Course Designer

Ms. S. Praveena

B.Com CA

(2023-2024)

II Semester



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
PG & RESEARCH DEPARTMENT OF COMMERCE
B.Com. CA – PROGRAMME STRUCTURE
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the candidates admitted from the academic year 2023 – 2024 onwards)

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
II	I	Language Course - II (LC)	ngkJj;jkpo; - II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar – II	22ULH2						
			Prose, Grammar and History of Sanskrit Literature	23ULS2						
			Basic French – II	22ULF2						
	II	English Language Course - II (ELC)	General English – II	23UE2	6	3	3	25	75	100
	III	Core Course - III (CC)	Modern Marketing	23UCC2CC3	6	5	3	25	75	100
		Core Course -IV (CC)	Web Design	23UCC2CC4	6	5	3	25	75	100
		First Allied Course - II (AP)	HTML (P)	23UCC2AC1P	4	3	3	40	60	100
	IV	Ability Enhancement Compulsory Course – II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
	Extra Credit Course		SWAYAM Online Course	As per UGC Recommendations						
		Total			30	21				600

Semester II	Internal Marks:25		External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS /	CREDITS	

			WEEK	
23UCC2CC3	MODERN MARKETING	CORE	6	5

Course Objectives

- To familiarize the students with basic knowledge of various concepts, dimensions and trends in modern marketing practices.
- To understand the moralities of sales distribution and control.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the various terms used in marketing and list out channels of distribution in marketing.	K1
CO2	Outline the role and importance of marketing and explain the factors and theories of buyer behavior.	K2
CO3	Apply different pricing strategies of a firm and identify various promotional programmes.	K3
CO4	Analyze the recent developments in marketing and strategies opted for market segmentation.	K4
CO5	Examine the factors influencing buyer behaviour and Categories the customers and their wants and needs.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	2	3	2	2	2	2
CO2	3	3	2	3	3	3	3	3	2	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight (Low) Correlation, “2”– Moderate (Medium) Correlation
“3”–Substantial (High) Correlation, “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Marketing – Definition, Concepts– Significance & Functions of Marketing – Approaches to the study of Marketing – Relevance of Marketing in a developing economy – Role & functions of Marketing Manager.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Consumer Behaviour: Nature and Importance – Factors influencing Consumer buying behaviour. Market Segmentation: Concept – Importance and bases – Product differentiation vs. Market Segmentation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Product: Meaning – Product Planning – Policies – Positioning – New Product Development – Product Life Cycle – Branding, Packing, Labeling. Pricing: Pricing Objectives – Factors, Methods and Procedure.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Promotion: Promotion Mix – Advertisement – Message – Copywriting - Budgeting – Measuring Advertisement Effectiveness – Media Strategy – Sales Promotion – Personal Selling and Publicity.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Marketing Strategies – Tools for competitive differentiation of product – Strategies for competitors – Leaders, challenges, follower and niches – Marketing of services – Consumerism.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self Study for Enrichment (Not to be included for External Examination) Various environment affecting the marketing functions – Market targeting – Distribution logistics: importance and decisions factors to be considered in channel selection.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. R. S. N. Pillai & V. Bagavathi (2010). Modern Marketing. S. Chand & Co.
2. N Rajan Nair, Sanjith R Nair.(2015). Marketing, Sultan Chand & Sons.

Reference Books

1. Dhruv Grewal. (2018).Marketing. Tata McGraw Hill India.
2. Philip Kotler. (2015).Marketing Management. Sultan Chand & Sons.
3. S. A. Sherlekar, R. Krishnamoorthy, (2010). Marketing Management. Himalaya Publishing House.

Web References

1. <http://gundasrinivas.com/wp-content/uploads/2020/11/Fundamentals-of-Marketing.pdf>
2. http://eprints.stiperdharmawacana.ac.id/24/1/%5BPhillip_Kotler%5D_Marketing_Management_14th_Edition%28BookFi%29.pdf
3. <https://library.wbi.ac.id/repository/212.pdf>
4. [http://www.mdudde.net/books/mcom/mcom-f/marketing-management-final\(crc\).pdf](http://www.mdudde.net/books/mcom/mcom-f/marketing-management-final(crc).pdf)

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. Shilpa A. Talreja.

B.Com CA

(2022-2023)

IV Semester



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
PG & RESEARCH DEPARTMENT OF COMMERCE
B.Com. CA – PROGRAMME STRUCTURE
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the candidates admitted from the academic year 2022 – 2023 onwards)

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total	
								Internal	External		
IV	I	Language Course - IV (LC)	gz;ila ,yf;fpaKk; ciueilAk;	22ULT4	6	3	3	25	75	100	
			Hindi Literature & Functional Hindi	22ULH4							
			Drama, History of Drama Literature	22ULS4							
			Intermediate French -II	22ULF4							
	II	English Language Course-IV (ELC)	Learning Grammar through Literature - II	22UE4	6	3	3	25	75	100	
	III	Core Course - VII (CC)	Cost Accounting	22UCC4CC7	5	5	3	25	75	100	
		Core Practical - I (CP)	Database Management Systems (P)	22UCC4CC1P	5	5	3	40	60	100	
		Second Allied Course – II (AC)	Business Tools for Decision Making	22UCC4AC4	4	3	3	25	75	100	
	Internship			22UCC4INT	-	2	-	-	-	100	
	IV	Generic Elective Course– II (GEC)	E-Business	22UCC4GEC2	2	2	3	25	75	100	
			Basic Tamil - II	22ULC4BT2							
			Special Tamil - II	22ULC4ST2							
		Skill Enhancement Course– I (SEC)	Accounting Package (P)	22UCC4SEC1P	2	2	3	40	60	100	
	Extra Credit Course			Swayam Online Course	As per UGC Recommendations						
		Total				30	25				800

Semester IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCC4CC7	COST ACCOUNTING	CORE	5	5

Course Objectives

- To familiarize the students with the basic concepts of cost and various methods of cost Accounting.
- To make aware about cost structure and cost elements.
- To understand the classification of overheads and methods of absorption.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the fundamentals of concept and elements of cost.	K1
CO2	Explain the cost control in the Manufacturing Sector.	K2
CO3	Identify the cost techniques and apply to the production of a company.	K3
CO4	Analyze the methods of costing for various Industries.	K4
CO5	Examine to prepare a statement of cost and estimate the profit of the company.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	2	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	2

“1” – Slight (Low) Correlation □ “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction – Evolution - Objectives – Elements of Cost Accounting – Financial Accounting Vs Cost Accounting - Cost Concepts – Classifications – Advantages – Demerits of cost accounting – Methods and techniques – Cost unit – Cost centre – Cost sheet – Tender and Quotation.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Material Cost – Techniques of Material Control – Level Setting - Purchase Procedures – Stores Procedure – Receipts and Issue of Materials – Stores organization and layout – Inventory Control – Levels of Stock, Perpetual Inventory, ABC Analysis, VED Analysis, EOQ – JIT Inventory System - Stores Ledger – Material Purchase and Storage Methods of Valuing Material issues: FIFO, LIFO, HIFO, Simple and Weighted average.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
III	Methods and Measurement of Labour Turnover - Labour Cost – Time recording and Time Booking – Methods of Remuneration and Incentive Scheme – Overtime and Idle time – Labour Turnover Types, Causes and Remedies.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
IV	Overheads - Concept – Collection and Classification of Overheads, Allocation, Apportionment of factory overheads – Primary – Secondary distribution – Repeated and Simultaneous Equation Method – Absorption –Machine Hour Rate - Recovery Rates – Over and Under Absorption – Activity Based Costing – Reconciliation of Cost and Financial Accounts.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
V	Methods of Costing - Job Costing, Contract Costing – Cost Plus – Contracts – Process Costing (Normal Loss, Abnormal Loss and Gains) – Operating Costing – Service Costing – Transport Costing.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4

VI	Self-Study for Enrichment (Not to be included for External Examination) Steps in installing a Cost Accounting System Activity based Costing, Life Cycle Costing, Target Costing Lean Costing and Six Sigma.		CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4

Distribution of Marks: Theory 25% & Problem 75%

Text Books

1. Jain, Narang. (2018). *Cost Accounting*, Revised Edition. Kalyani Publications.
2. Reddy T.S, Hari Prasad Reddy. Y. (2020). *Cost Accounting*. Revised Edition. Margham Publications.
3. Arora.M.N. (2021). *Text book Cost Accounting: Principles and Practice*. Revised Edition. Vikas Publishing House.

Reference Books

1. Maheswari.S.N. (2017). *Cost Accounting*. Revised Edition. Sultan Chand & Sons.
2. Pillai, Bhagavathi. (2016). *Cost Accounting*. Revised Edition. Sultan Chand & Sons.
3. Khan.M.Y , Jain.P.K. (2017). *Cost Accounting*. Revised Edition. McGraw Hill Education.

Web Reference

1. <https://www.godigit.com/business-insurance/business-terms/life-cycle-costing> 3.
2. <https://www.goskills.com/Lean-Six-Sigma>
3. https://www.academia.edu/4265381/Cost_Accounting
4. https://www.icai.org/post.html?post_id=17759
5. <https://icmai.in/upload/Students/Syllabus2016/Inter/Paper-8-New.pdf>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. G.Kanagavalli

Semester IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCC4AC4	BUSINESS TOOLS FOR DECISION MAKING	ALLIED	4	3

Course Objectives

- To understand the basic concepts of statistics in relation to business environment.
- To compute measures of location of variation and its relative measures.
- To construct and interpret the index numbers.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the basic concepts of business tools.	K1
CO2	Explain and apply the logic and methodology for calculation of various index numbers, time series, measure of central tendency and dispersion.	K2, K3
CO3	Examine the cause accruing when price level changes.	K3
CO4	Identify and analyze the linear relationship between the variables through correlation and regression.	K3, K4
CO5	Analyze the time series, price and quantity index numbers.	K4

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	3	3	3	2	2	2	2
CO2	2	3	2	3	3	3	3	2	2	2
CO3	2	3	2	3	3	3	3	2	2	2
CO4	2	3	2	3	3	3	3	2	2	2
CO5	2	3	2	3	3	3	3	2	2	2

“1” – Slight (Low) Correlation □ “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Statistics: Meaning, Definition, Importance, Scope, Limitations and Distrust of statistics – Sampling – Meaning – Definition – Methods of Sampling – Collection of Data – Tabulation of Data – Diagrammatic And Graphic Representation Of Data	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Measures of Central Tendency and Dispersion: Mean, Median, Mode, Quartiles. Standard Deviation and Co-efficient of variation - Skewness and Kurtosis.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Correlation – Karl Pearson's Co-efficient of Correlation – Spearman's Rank Correlation of co-efficient – Regression – Properties of Regression co-efficient, Co-efficient of determination. \	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Index Numbers – Definition, Simple Index Number and Weighted Index Number: Laspeyres's, Paasche's, Fisher's, Marshal Edge-worth, Bowley's and Kelly's formula. Mathematical test of consistency: Time reversal test, Factor reversal test – Fixed index number – Chain index number – Cost of living index.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Elements of Time Series – Secular trend: Method of Graphic, Semi-Averages, moving averages, least squares. Seasonal Fluctuations: Method of simple averages and moving averages	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment (Not to be included for External Examination) Sampling – Methods – Collection of data – Tabulation of data – Diagrammatic representation of Data.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Distribution of Marks: Theory 25% & Problem 75%

Text Books

1. Gupta S.P. (2022). *Statistical Methods*. 46th Edition, Sultan Chand & Sons.
2. Navanitham P A. (2022). *Business Statistics*. Reprint, Jai Publishers.
3. Vittal P.R. (2020). *Business Statistics*. Reprint, Margham Publications.

Reference Books

1. Gupta S.C. (2018). *Fundamentals of Statistics*. 7th Edition, Himalaya Publishing House.
2. Jani P.N. (2017). *Business Statistics Theory and Applications*, Reprint, PHI Pvt., Ltd.
3. Sharma J.K. (2018). *Business Statistics*. 5th Edition, Vikas Publishing House Pvt., Ltd.

Web Reference

1. <https://www.geeksforgeeks.org/introduction-of-statistics-and-its-types/>
2. <https://www.bmj.com/about-bmj/resources-readers/publications/statistics-square-one/11-correlation-and-regression>
3. <https://www.cuemath.com/data/probability/>
4. <https://www.tableau.com/learn/articles/time-series-analysis>
5. <https://www.geeksforgeeks.org/index-number-meaning-characteristics-uses-and-limitations/>

Pedagogy

Chalk and Talk, Powerpoint Presentation, Discussion, Assignment, Quiz and Seminar.

Course Designer

Ms. D. Indumathi.

8Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCC4GEC2	E - BUSINESS	GENERIC ELECTIVE	2	2

Course Objectives

- To familiarize the students with digital platform and how e -business differs from traditional business in terms of business process and activities.
- To enable the students to learn online business strategy by adopting innovative information and communications.
- To ensure that the students get hands on experience to set up and promote a business online.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the basic concept of E-business and their different element.	K1
CO2	Summarize the process of developing and implementing E – payments.	K2
CO3	Select appropriate business strategies for buyer or vendor.	K3
CO4	Analyze and apply different marketing technologies required for the successful management and administration of e- business in a global environment.	K3, K4
CO5	Analyze the issues surrounding privacy, security, taxation in the conduct of e- business activities.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3	3	3	3	2	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	E - Commerce – Definition, history of E-commerce, types of E-commerce B to B. Comparison of traditional commerce and e-commerce, E-commerce business models – Major B to B, B to C model - Consumer-to-consumer (C2C), Consumer – to - Business (C2B) model, peer to-peer (P2P) model – Emerging trends – Advantages and Disadvantages of e-commerce - Web auctions - virtual communities - portals, e-business revenue models.	6	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Security threats - An area view – Implementing E-commerce security – encryption – decryption, protecting client computers - E-Commerce communication channels and web server's encryption- SSL protocol – firewalls - Cryptography methods - VPNs, protecting - network policies and procedures.	6	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
III	E - payment systems – An overview- B to C payments- B to B payments- Types of E - payments systems - digital cash - digital cash - digital wallets - smart cards and digital cheques - secure electronic transaction (SET) protocol.	6	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
IV	E - Commerce and marketing - B to B and B to C marketing and branding strategies in E-Marketing. Web transaction logs – cookies - shopping cart database - DBMS, SQL - data mining.	6	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
V	Legal aspects of E-Business - internet frauds – cyber laws. IT Act 2000 salient features.	6	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
VI	Self-Study for Enrichment (Not to be included for External Examination) Startups		CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4

	Meaning, definition and nature of E- start up. Challenges and steps of launching online business benefits limitations of online business. Meaning and benefits of E- procurement. Types and drivers of E- procurement. Components of e- procurement system - Implementation of e- procurement system - Reason behind the success of e- commerce companies.			

Text Books

1. SIA Publishers. (2022). *E-Busines*. Latest Edition. SIA Publishers & Distributors Pvt Ltd
2. Goldink. (2021). *E-Commerce Business through Social Media Marketing*. Latest Edition. Goldink Publishers LLC
3. Joseph.P.T.(2019). *E-Commerce: An Indian Perspective*. 6th edition. PHI Learning Pvt. Ltd.;

Reference Books

1. Dr. Krishna Gupta, Dr. Ruchir Saxena, Mahendra Singh Panwar. (2023). *E-Commerce Technologies (BCA-51T-108)*. Revised Edition. Neelkanth Publishers Private Limited
2. Datta.D.L, Dr Debnath. S. K. (2020). *E-Commerce & Business Communication*. Revised Edition. Tee Dee Publications
3. Matthew Scott. (2019). *Ecommerce*. Revised Edition. Platinum Press LLC.

Web Reference

- 1 [https://www.techtarget.com/searchcio/definition/e-commerce#:~:text=E%2Dcommerce%20\(electronic%20commerce\),or%20consumer%2Dto%2Dbusiness.](https://www.techtarget.com/searchcio/definition/e-commerce#:~:text=E%2Dcommerce%20(electronic%20commerce),or%20consumer%2Dto%2Dbusiness.)
- 2 <https://www.slideshare.net/dattatreyareddyperam/security-threats-in-ecommerce>
- 3 <https://www.slideshare.net/RiteshGoyal/electronic-payment-system>
- 4 <https://www.slideshare.net/sanamNayak/ecommerce-marketing-103851815>
- 5 <https://www.slideshare.net/ImmoBhm/legal-aspects-of-e-commerce-37347149>

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar, Experience Discussion & Group Discussion.

Course Designer

Ms. Shilpa A. Talreja

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCC4SEC1P	ACCOUNTING PACKAGE (P)	SKILL ENHANCEMENT	2	2

Course Objectives

- To understand the basic concepts of accounting.
- To enable the students to learn basic concepts of accounting packages.
- To access the applications of accounting by using Tally ERP 9.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the basic concepts of manual accounting.	K1
CO2	Explain the procedure for creating a company.	K2
CO3	Apply the accounting procedure for grouping of accounts and ledger creation.	K3
CO4	Analyze the financial statement and reports.	K4
CO5	Assess the Estimate of inventory calculations.	K5

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	2	2	2	2	2
CO2	2	2	3	2	2	2	2	2	2	2
CO3	2	3	3	3	2	3	2	3	3	3
CO4	2	3	3	3	2	3	2	3	2	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation
“3” – Substantial(High)Correlation“-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Computerized Accounting – Meaning and Features – Advantages and Disadvantages – Computerized Vs. Manual Accounting.	6	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4,K5
II	Starting Tally – Gateway to Tally and exit from Tally- Company Creation in Tally, Saving the company profile - Alteration - Deletion of company, Selection of Company.	6	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4,K5
III	Configuration and Features of Group Creation - Multiple Group Creation - Ledger Creation - Multiple Ledger Creation - New Voucher Creation- Advance Ledger Creation.	6	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4,K5
IV	Creation of Accounts and inventory – Entering transactions in Vouchers – Types – Numbering– Deleting and Editing vouchers – Opening and closing balances.	6	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4,K5
V	Inventory - configuration and features Inventory info - Menu - Stock groups - Stock categories and Stock item - Unit of measurement - Bills of materials – Godowns - Batches - Expiry Inventory voucher types.	6	CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4,K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Hierarchy of account groups and ledgers, reserved account groups, account groups balance sheet.		CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4,K5

List of Practicals

1. Creation, alteration and deletion of companies.
2. Creation of user defined accounting groups.
3. Creation, alteration and deletion of ledger.
4. Creating of final accounts and balance sheet.
5. Voucher entries in double entry mode.
6. Creation, alteration and deletion of inventory masters.
7. Summary of inventory master.

Text Books

1. VishnuP.Singh. (2021). *Tally ERP 9 with GST*. Revised Edition. Sultan Chand & Sons.
2. Srinivasa vallabhan.V. (2020). *Computer Applications in business*. Revised Edition. Sultan Chand & Sons.
3. Mohan Kumar K, Rajkumar.S.(2019). *Computer applications in business*. Revised Edition. Tata McGraw Hill Education.

Reference Books

1. Parag Joshi. (2017). *Tally ERP 9 with GST*. Revised Edition. Dnyansankul Prakashan.
2. Nadhani.A.K. (2019). *Implementing Tally*, Revised Edition. BPB Publications.
3. Sanjay Satapathy. (2018). *Tally ERP 9 book*. Revised Edition. Advanced usages.

Web Reference

1. <https://gstcentre.in/gst-in-tally-erp-9.php#collapseOne>
2. <http://www.tallysolutions.com>
3. https://help.tallysolutions.com/docs/te9rel66/Job_Work/#gref
4. <https://www.tallyofficialbooks.com/>
5. <https://ncsmindia.com/wp-content/uploads/2012/04/TALLY-9.0-PDF.pdf>.

Pedagogy

Lecture, Power Point Presentation, Lab Demonstration, Group Discussion, Quiz, Assignment and Activity.

Course Designer

Dr.A.Vinodhini

B.Com CA

(2022-2023)

V Semester



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
PG & RESEARCH DEPARTMENT OF COMMERCE
B.Com. CA – PROGRAMME STRUCTURE
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the candidates admitted from the academic year 2022 – 2023 onwards)

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
V	III	Core Course – VIII (CC)	Accounting for Managerial Decisions	22UCC5CC8	6	6	3	25	75	100
		Core Course - IX (CC)	R for Data Analysis	22UCC5CC9	5	5	3	25	75	100
		Core Course - X (CC)	Digital Marketing	22UCC5CC10	5	5	3	25	75	100
		Core Practical - II (CP)	R Programming (P)	22UCC5CC2P	5	5	3	40	60	100
		Discipline Specific Elective – I (DSE)	A. Business Correspondence and Reporting	22UCC5DSE1A	5	4	3	25	75	100
			B. E-Retailing	22UCC5DSE1B						
			C. Mobile Applications	22UCC5DSE1C						
	IV	Ability Enhancement Compulsory Course-IV (AECC)	UGC Jeevan Kaushal -Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course– II (SEC)	Skills for Competitive Examination	22UCC5SEC2	2	2	3	-	100	100
		Extra Credit Course	Swayam Online Course	As per UGC Recommendations						
		Total				30	29			700

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UCC5CC8	ACCOUNTING FOR MANAGERIAL DECISIONS	CORE	6	6

Course Objectives

- To understand the concepts and techniques of Management Accounting.
- To enhances a manager's ability to make effective Economic Decisions.
- To understand and analyse accounting information for Decision making, Planning and Control.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	List out the concepts of Accounting and to show the performance of the firm through preparation of Financial Statements.	K1
CO2	Infer on the financial statements and develop knowledge to prepare the fund flow and cash flow statement.	K2
CO3	Construct to prepare the various types of Budgets.	K3
CO4	Apply cost volume profit analysis in Decision Making.	K4
CO5	Categorize the process of making investment decisions regarding capital expenditure.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	3	2	2	3	3	3	2	3	2
CO3	3	3	2	3	2	3	3	2	3	3
CO4	3	3	2	3	3	2	3	3	3	3
CO5	3	3	2	3	3	2	3	3	3	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation
“3”–Substantial (High)Correlation“-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Management Accounting: Meaning – Definition – Objectives – Nature and Scope – Role of Management Accountant – Relationship between Financial Accounting, Management Accounting and Cost Accounting. Analysis of Financial Statements: Types of Analysis – Methods of Financial Analysis – Problems on Comparative Statement analysis, Common Size and Trend Analysis.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Fund Flow Statement - Meaning - Concept of Fund - Uses and Limitations of Fund Flow Statement – Differences between Cash Flow Statement and Fund Flow Statement - Procedure for preparation of Fund Flow Statement - Cash Flow Statement - Preparation of Cash Flow Statement according to AS 3.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
III	Ratio Analysis (Liquidity, Solvency, Profitability, Activity Turnover and Capital Structure). (Simple problems only), Marginal Costing – CVP analysis – Break Even Analysis – BEP.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
IV	Budget and Budgetary control – Meaning – Advantages – Preparation of Sales, Production, Purchase, Overhead Cost, Cash and Flexible Budgets.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
V	Capital Budgeting – Payback Period- Accounting Rate of Return (ARR) – Discounted Cash Flow Method - Net Present Value Method – Present Value Index Method – Internal Rate of Method (IRR).	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4

VI	Self-Study for Enrichment (Not to be included for External Examination) Meaning of Management Reporting – Requisites of a Good Reporting System– Principles of Good Reporting System – Methods of Reporting – Kinds of Reports – Process of Report Writing – Drafting of Reports under different Situations.		CO1, CO2,CO3, CO4,CO5	K1, K2, K3,K4

Text Books

1. M.N Arora(2015). *Cost and Management Accounting*. Himalaya Publishing House.
2. S.N.Maheshwari (2015). *Advanced Cost Accounting*. Sultan Chand & Sons.
3. Ramachandran, Srinivasan (2015). *Management Accounting*. Sri Ram Publications.

Reference Books

1. R.S.N.Pillai, Bhagavati (2015). *Management Accounting*. S.Chand Publications.
2. Khan and Jain (2015). *Management Accounting*. Tata McGraw Hill.
3. Atrill, Petere Eddie Mc Laney (2014). *Management Accounting for Decision Makers*. Prentice Hall.

Web Reference

1. <https://www.ddegjust.ac.in/studymaterial/mcom/mc-105.pdf>.
2. <https://www.lkouniv.ac.in/site/writereaddata/siteContent/202003291608409504audhes h cash flows and fund flows.pdf>.
3. <https://www.dynamictutorialsandservices.org/2018/10/management-accounting-notes-budget-and.html>.
4. <https://dde.pondiuni.edu.in/files/StudyMaterials/MBA/MBA3Semester/Finance/5AccountingManagement.pdf>
5. <https://www.lkouniv.ac.in/site/writereaddata/siteContent/202003291623594854nimisha capital budgeting.pdf>.

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Capt. Dr. P. Kavitha

Semester V	Internal Marks: 25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS. / WEEK	CREDITS
22UCC5CC10	DIGITAL MARKETING	CORE	5	5

Course Objectives

- To assess the students to develop an overall understanding of digital marketing and social media platforms.
- To inculcate the entrepreneurial qualities among the students with sufficient knowledge about digital marketing channels for starting their own online business.
- To identify the challenges and opportunities in the digital marketing platform.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the basic concepts of dynamics in digital marketing	K1
CO2	Summarize the concept of social media marketing and the rise of online social networking sites.	K2
CO3	Construct and Identify the various digital media channels	K3
CO4	Utilize the social media platforms such as face book, twitter, instagram, you tube.	K3
CO5	Analyze the customer relationship management in the digital campaign	K4

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	2	3	2	2	2	2
CO2	3	3	2	3	3	3	3	2	2	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	2	2	3	3	3
CO5	3	3	3	3	3	3	2	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Digital Marketing: Meaning - Definition - Objectives - Characteristics - Importance - Types - Merits and Demerits - Traditional Vs Digital Marketing - 7Ps of Digital Marketing - Content marketing - Strategic flow of marketing activities - Skills of content writer.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	E-Mail Marketing and Mobile Marketing: E-mail Marketing - Meaning, Definition - Working of E-Mail Marketing - E-Mail Marketing Tips - Content Strategies - E-mail Newsletter - Mobile Marketing - Introduction, Meaning, Definition, Features of Mobile Marketing - Merits and Demerits.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Social Media Marketing : Meaning - Definition - Evolution of Social Media - Social Networking Sites - Functions and Benefits of Social Media Marketing - Limitations - Social Media metrics Platforms: Facebook - X - YouTube - Instagram - WhatsApp - LinkedIn - Snapchat.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Electronic Customer Relationship Management in a Web 2.0 World: Meaning - Goals of CRM - Benefits of Electronic CRM Technology in Online Banking - CRM Processes - Role of CRM Technology - CRM and the Customer Lifecycle - Bonding for Customer Relationship - Electronic CRM - Key CRM Applications.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Web Analytics and Gamification: Meaning, Definition - Features - Importance - Types - Key Metrics used for Web Analytics - Types of tracking codes. Gamification and game based marketing - Benefits - Consumer motivation for playing online games.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Digital Marketing Strategy - Digital Marketing Planning and Development - Digital Marketing Emerging Trends and Concepts - Emerging opportunities for Digital Marketing Professionals - Display Advertising - Ethical Challenges: Frauds on the Web.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. Seema Gupta. (2022). *Digital Marketing*. 3rd Edition. McGraw Hill Publications Noida.
2. Puneet Singh Bhatia. (2020). *Fundamentals of Digital Marketing*. 2nd Edition. Pearson Education Pvt Ltd. Noida.
3. Kailash Chandra Upadhyay. (2021). *Digital Marketing: Complete Digital Marketing Tutorial*. Revised Edition. Notion Press. Chennai.

Reference Books

1. Vandana Ahuja. (2021). *Digital Marketing*. Latest Edition. Oxford University Press, New Delhi.
2. Dr. Rushen Chahal, Prof. Jayanta Chakraborti. (2022). *Digital Marketing 2.0*. Himalayas Publishing House. Mumbai.
3. Maity Moutusy. (2022). *Digital Marketing*. 2nd Edition. Oxford University Press. London.

Web References

1. <https://www.digitalmarketer.com/digital-marketing/assets/pdf/ultimate-guide-to-digital-marketing.pdf>
2. <https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/educational-technologies/all/gamification-and-game-based-learning>
3. <https://journals.ala.org/index.php/ltr/article/download/6143/7938>
4. <https://www.investopedia.com/terms/d/digital-marketing.asp>
5. <https://www.encyclopedia.com/finance/finance-and-accounting-magazines/emarketing#:~:text=E%2Dmarketing%20is%20a%20process,exchanges%20and%20satisfy%20customer%20demands.>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr. D. Ramya

Semester - V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UCC5DSE1A	BUSINESS CORRESPONDENCE AND REPORTING	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objective

- To acquire good communication skills requisite for business correspondence and reporting.
- To provide an overview of prerequisites to Business Communication.
- To impart the correct practices of the strategies of Effective Business writing.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the basic concept of business communication.	K1
CO2	Explain the skill of ethical, legal, cultural and global issues affecting business communication.	K2
CO3	Identify appropriate organizational formats and channels used to develop business communication.	K3
CO4	Analyze the situation of writing various types of business letters and reports.	K4
CO5	Examine the problem solving skills appropriate to business communication.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	2	3	3
CO2	2	3	3	2	2	3	2	3	2	2
CO3	3	2	3	3	3	2	2	3	3	3
CO4	3	3	3	2	3	3	3	2	2	3
CO5	3	3	3	2	2	3	3	2	3	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Definition of business Communication - meaning – objectives – Process - Characteristics of effective communication – Types of communication - Barriers to communication, Steps to overcome the barriers. Commercial terms and abbreviations.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4,K5
II	Meaning of Business letter – Need - Functions - kinds of Business letters – Essentials of an effective Business Letter – Layout – Appearance – Size – Style – Form and punctuation – Routine request letters – Responses to letters – Refusal letters – Claim letters – Collection letters – Job application letter –Curriculum vitae.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
III	Letters of Enquiry – Opening and closing sentences in letters of enquiry – Quotations – Voluntary offers and quotations – Sentences regarding offers and quotations – Placing an order – Cancellation, Acknowledgement, Refusal and execution of order - Complaint letters, claims and adjustments - follow-up.	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
IV	Meaning of Circular letters – Objectives – Situations that need Circular letters – Sales letters – Meaning - Objectives – Advantages – Three P's functions, Bank Correspondence – Correspondence with customers, Head Office and with other banks.	15	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
V	Report Writing: Formal Reports – the elements of clear writing – writing effective letters – different layouts of business letters – informal reports – writing good news and bad news – meetings and oral presentations. Online Communication - Communication	15	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4

	network, Intranet, Internet - Teleconferences, Voicemail - Video Conferencing - SMS - Telephone Answering Machine.			
VI	Self-Study for Enrichment (Not to be included for External Examination) Verbal and Non – Verbal communication - Spoken Communication - Body Language – Facial Expression – Para language.		CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4

Text Books

1. Rajendra Pal, Korlahalli.J.S. (2015). *Essentials of Business Communication*. Revised Edition. Sultan Chand & Sons
2. Gupta.C.P.(2018). *Business Correspondence and Report Writing*, Revised Edition. Taxmann
3. Sharma. (2017). *Business Correspondence and Report Writing*, Revised Edition. Tata Mc-Graw Hill

Reference Books

1. Sekar.G, Saravana Prasath.B. (2023). *Business Law and Business Correspondence and Reporting*. Current Edition. Commercial Law House
2. Sharma.RC, Krishna Mohan, Virendra Singh and Nirban (2020). *Business Correspondence and Report Writing*. Current Revised. McGraw Hill
3. Bharat. (2023). *Business Correspondence and Report Writing*. Revised Edition. Bharath Law house

Web References

1. https://www.icai.org/post.html?post_id=13826
2. https://www.srinivasaacademy.com/downloads/219/15_Paper2RTPMay2019.pdf
3. <https://castudynotes.com/2022/01/15/ca-foundation-paper-2b-business-correspondence-and-reporting-bcr-notes-charts-lectures-all-compilation-at-one-place-in-pdf/>
4. <https://cablogindia.com/business-correspondence-and-reporting-bcr-notes-for-ca-foundation/>
5. <https://www.scribd.com/document/427573064/Business-Correspondence-and-Reporting-Compiled-pdf>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. G.Kanagavalli

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UCC5DSE1B	E – RETAILING	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives

- To introduces e-retailing frameworks, and technological foundations.
- To examines basic concepts such as strategic formulation for e-retailing enterprises, management of their capital structures and marketing an online store.
- To familiarize students with innovative ideas in e- retailing.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the theoretical concepts of e – retailing.	K1
CO2	Outline current and emerging electronic retailing changes.	K2
CO3	Explain online merchandise techniques and apply e – retailing pricing strategies.	K2, K3
CO4	Identify the methods of online pricing and payment process.	K3
CO5	Examine the effectiveness of e – retailing.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3	3	2	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation □ “2” – Moderate (Medium) Correlation
 “3”–Substantial (High) Correlation“-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Meaning – Definition – Transition from Traditional Marketing to e-marketing – Demographics and Targeting – Adaptability and Closed – Loop marketing – Advantages of e-Retailing – Short comings of e-Retailing.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4
II	Understanding on e-consumer – Normal Consumer – Communicating with e-consumer – E - Application Perspective – Building Customer Loyalty – CRM implementation – Customer Service – gift Reminder Services, Contests and Promotions, Online Communities – Loyalty Programs, Personalization.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4
III	Impact of Information Technology in Retailing – Integrated System and Networking – EDI – Bar Coding – Electronic Article Surveillance – Electronic Shelf Labels – E-Service. Online Payment Processing – Internet Payment Gateways – Internet Security Issues.	15	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
IV	E-retailing and Supply Chain Management System – Concept of Online Pricing – Factors affecting Online Pricing – Different methods of Online Pricing – Price discrimination in E-retailing – Pricing Strategies for Information Goods – Dynamics Pricing for E-retailing.	15	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4
V	Inventory Based Model – Market Place Model – Vendor Development – Business Expansion and Legal Implications.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4
VI	Self-Study for Enrichment (Not to be included for External Examination) E-retailing Online Merchandising Techniques – E-Malls – Future of E-Retailing – The roles of Cyber Intermediaries in E-retailing – Promotional Strategies of E-retail Business.		CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4

Text Books

1. Michael Levy, Barton A. Weitz, Dhruv Grewal. (2023). *Retailing Management*. Standard Edition. McGraw Hill.
2. Rama Mohana Rao.K, Chandra Sekhar Patro (2022). *E-Retailing and Consumer Behaviour*. Kindle Edition.
3. Tawfik Jelassi, Albrecht Enders. (2014). *Strategies for e – business*. Springer.

Reference Books

1. Vijay Kumar.A. (2011). *Retailing in India - Trends and Challenges*. Discovery Publishing House Pvt Ltd.
2. Sharma.D.P (2015). *e-Retailing Principles and Practice*. First Edition. Himalaya Publishing House.
3. Gibson. (2017). *Retail Management*. 5th edition. Pearson Education.

Web Reference

1. <https://businessjargons.com/electronic-retailing.html>
2. <https://egyankosh.ac.in/bitstream/123456789/15063/1/Unit-13.pdf>
3. <https://theecommanager.com/ecommerce/what-is-ecommerce-crm/>
4. <https://www.getastra.com/blog/knowledge-base/ecommerce-security/>
5. <https://www.cloudways.com/blog/latest-ecommerce-trends/>

Pedagogy

Lecture, Power Point Presentation, Group Discussion, Seminar, Experience

Discussion and Assignment.

Course Designer

Ms. S. Praveena

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UCC5DSE1C	MOBILE APPLICATIONS	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives

- To understand the basic concepts of mobile application development.
- To know the characteristics of mobile applications, user-interface design, basics of graphics and multimedia.
- To gain knowledge about testing and publishing of Android application.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Relate various concepts of mobile programming that make it unique from programming for other platforms.	K1
CO2	Explain the basics of mobile applications development.	K2
CO3	Apply Android application with user interface, networking and animation.	K3
CO4	Identify and analyze simulator tools to test and publish the application.	K3.K4
CO5	Examine the mobile applications on their design pros and cons.	K4

Mapping of CO with PO and PSO

Cos/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Mobile Applications and Device Platforms – Alternatives for Building Mobile Apps – Comparing Native Vs. Hybrid Applications – Mobile Application Development Lifecycle – Mobile Application Front - End and Back - End – Key Mobile Application Services. Android version - Obtaining the required tools – Launching the application – Exploring the IDE – Debugging and publishing application.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Linking Activities using intents – Fragments – Displaying notification – Understanding the component of a screen – Adapting to display orientation – Managing changes to screen orientation – Utilizing the action bar – Creating the user interface programmatically listening for UI notification.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Using basic views – Picker views - list view to display long list – Understanding specialized fragments- Image views to display pictures – Using menus with views – Using web view – Saving and loading user preferences – Persisting Data to files - Creating and using database.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Sharing Data in android – Creating your own content providers – using the content provider – SMS messaging – sending email – Displaying maps – Getting location data – Monitoring a location.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Consuming web services using HTTP – consuming JSON services – Creating your own services – Binding activities to services – Understanding threading.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment (Not to be included for External Examination) Android terminology – Android Manifest File – Using Intent Filter – Different types of resources.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Lauren Darcey, Shane Conder . (2013). *Android Wireless Application Development*. Revised Edition. Pearson Education.
2. Sydhani Begum.S. (2019). *Mobile App Development*. Revised Edition. Notion Press.
3. Virat.V.Giri, Sagar Chavan, Ashwin Mane. (2019). *Mobile Application Development*, Revised Edition. TechKnowledge.

Reference Books

1. Bagad.V.S. (2023). *Mobile Application Development*. Current Edition. Technical Publication.
2. Barry Burd, John Paul Mueller (2021). *Android Application Development*, Revised Edition. Wiley.
3. Pradeep Kothari. (2014). *Android Application Development*. Revised Edition. Dreamtech Press.

Web Reference

1. <https://developer.android.com/guide>
2. <https://www.wideskills.com/android/building-user-interface/listening-to-ui-notifications-in-android>
3. <https://www.geeksforgeeks.org/imageview-in-android-with-example/>
4. <https://developer.android.com/training/sharing/send>
5. <https://vkinfotek.com/webservice/consume-web-service.html>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr.C.Subha.

Semester V	Internal Marks: Nil		External Marks: 100	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UCC5SEC2	SKILLS FOR COMPETITIVE EXAMINATION	SKILL ENHANCEMENT COURSE	2	2

Course Objectives

- To develop competitive skills through various types of objective tests..
- To train them by conducting aptitude test based on verbal and quantitative skills.
- To motivate the students to prepare for high level competitive exams.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Select prospective career in Government and Corporate Sector	K1
CO2	Outline a sense of awareness and other information about various competitive examinations	K2
CO3	Summarize professional and ethical attitude and choose effective communication skills	K2, K3
CO4	Solve a problem and to identify the appropriate computing requirement	K3
CO5	Take part in the competitive examination.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation □ “2” – Moderate (Medium) Correlation

“3”–Substantial (High) Correlation “-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Coding and Decoding – Puzzles – Seating Arrangement – Logical reasoning – Ranking and Order – Alphanumeric series – Data Sufficiency – Syllogism – Input and Output – Statement, Argument and Assumption – Reasoning Analogy – Reasoning Inequality – Fundamental arithmetical operations – Blood Relations.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Simplification and Approximation – Profit and Loss – Number Series – Quadratic Equations – Problems on Ages – Boat and Stream – Speed, Time and Distance – Percentage – Ratio and Proportion – Number System – Simple and Compound interest – Menstruation – Mixture and Allegations – Time and Work – Pipes and Cistern – Problems on Trains.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Data Interpretation (Bar Graph, Line Chart, Tabular, Caselet, Radar/Web, Pie Chart) – Linear Equation – Probability. Cloze Test – Sentence Improvement – Sentence Correction – Para Jumbles – Connectors – Reading Comprehension – Spotting Errors – Spelling Errors – Word Rearrangement – Word Usage – Sentence based Error.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Current Affairs – Banking Awareness – GK Updates, Currencies – Important Places – Books and Authors – Awards – Headquarters, Prime Minister Schemes – Important Days.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	History of Computers – Data Processing Cycle of a Computer – Computer Languages – Input Devices & Output Devices – Operating Systems – Database Management Systems – Microsoft Office – Keyboard Shortcuts – File Extensions – Networking and Internet – Computer Viruses – Important Abbreviations ICT: General abbreviations and	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	terminology - Basics of Internet, Intranet, E-mail, Audio and Video-conferencing – ICT and Governance.			
VI	Self-Study for Enrichment (Not to be included for External Examination) Basic Computer Knowledge – Computer Fundamentals – Parts of a Computer System – Digital initiatives in higher education – Basic Computer Knowledge	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Dr. Aggarwal, R.S. (2022). *A Modern Approach to Logical Reasoning All Competitive Exams*. Revised Edition. Sultan Chand
2. Pandey, M.K. (2023). *Analytical Reasoning*. 5th Edition. Bsc Publishing Co. Pvt. Ltd
3. Dr. Aggarwal, R.S. (2022). *Quantitative Aptitude for Competitive Examinations All Government and Entrance Exams*. S Chand Publishing.

Reference Books

1. Disha. (2022). *The Yearly Current Affairs 2023 for Competitive Exams*, 8th edition. Disha Publication.
2. Abhijit Guha. (2020). *Quantitative Aptitude for Competitive Examinations*. Seventh edition McGraw Hill.
3. Oswal. (2020). *An Advanced Approach to Verbal & Non-Verbal Reasoning for Competitive Exams*. Revised Edition. Oswal Printers & Publishers Pvt. Ltd.

Web Reference

1. <https://www.examsbook.com/reasoning-ability-questions-and-answers>
2. <https://www.javatpoint.com/aptitude/quantitative>
3. <https://www.examsbook.com/general-english-questions-and-answers-for-competitive-exam>
4. <https://www.examsbook.com/gk-questions-on-current-affairs-for-competitive-exams>
5. <https://testbook.com/objective-questions/mcq-on-computer-fundamentals--5fb69dfc1b5c16e438f976f6>

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussion

Course Designer

Ms. S. Praveena

Allied Course

BCA & B. Sc IT

Semester IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	Credits
22UCA4AC6	BUSINESS COMMUNICATION	ALLIED	4	3

Course Objectives

- To provide an overview of prerequisites to Business Communication.
- To impart the correct practices of the strategies of Effective Business writing.
- To acquire good communication skills requisite for business correspondence and reporting.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Select the appropriate organizational formats, channels used in developing and presenting business messages.	K1
CO2	Explain the modern communication used in the business.	K2
CO3	Summarise the process of report writing and develop the interview techniques.	K2, K3
CO4	Identify ethical, legal, cultural and global issues affecting business communication.	K3
CO5	Analyse the situation of writing various types of letters.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	3	3	2
CO2	3	3	3	3	2	2	2	3	3	2
CO3	3	3	3	3	2	3	2	2	3	2
CO4	3	3	2	3	3	3	2	2	3	2
CO5	3	3	3	3	2	2	2	2	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3”–Substantial (High) Correlation“-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Communication – Needs – Objectives – Communication Media – Process – Characteristics – Barriers of Communication – Steps to overcome barriers of Communication.	12	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Business letter – Needs – Function – Kinds of Business letter – Essentials of an Effective Business letter – Structure of Business letter – Letter of Enquiries and replies.	12	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
III	Application letter – Preparation of Resume – Interview Meaning – Objective and Interview Techniques – Interviewee's Preparation for the Interview and Conduct during the Interview.	12	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
IV	Modern forms of Communication – Email Mechanics of an e-mail – Layout of e-mail Teleconference , voicemail – Internet – multimedia Teleconferencing – Mobile Phone – SMS – Telephone Answering machine.	12	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
V	Reports – Introduction – Types – Preparation – Structure and Organization of reports – Reports by individuals and committees press releases.	12	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4,K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Circular letters – Objectives – Situations that need Circular letters – Sales letters – Bank Correspondence.	-	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4

Text Books

1. Rajendra Pal , J.S. Korlahalli (2015). *Essentials of Business Communication*. Reprint. Sultan Chand & Sons.
2. Sharma R. C, Krishna Mohan (2017). *Business Correspondence and Report Writing* . 6th Edition Tata Mc-Graw Hill.
3. Subba Rao .P (2013). *Business Communication*. Reprint. Cengage Learning India..

Reference Books

1. Krishnamacharyulu, Lalitha. R (2018). *Business communication*. 3rd Edition. Himalaya Publishing House.
2. Mathur S. P (2017). *Business Communication*. 2nd Edition. New Age International Publishers.
3. Sundar K, Kumara Raj .A (2019). *Essentials of Business Communication*. Reprint. Vijay Nicole Imprints Private Limited.

Web Reference

1. <https://www.marketingtutor.net/communication-media-definition-types-examples/>
2. <https://www.vedantu.com/commerce/essential-qualities-of-a-good-business-letter>
3. <https://www.themuse.com/advice/the-ultimate-interview-guide-30-prep-tips-for-job-interview-success>
4. <https://www.yourarticlelibrary.com/business-communication/modern-forms-of-communication-fax-email-and-videoconferencing/27654>
5. <https://www.eapfoundation.com/writing/reports/structure/>

Pedagogy

Lecture, Power Point Presentation, Group discussion, Seminar and Assignment.

Course Designer

Mrs. D. Indumathi.

Semester IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	Credits
22UIT4AC6	BUSINESS COMMUNICATION	ALLIED	4	3

Course Objectives

- To provide an overview of prerequisites to Business Communication.
- To impart the correct practices of the strategies of Effective Business writing.
- To acquire good communication skills requisite for business correspondence and reporting.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Select the appropriate organizational formats, channels used in developing and presenting business messages.	K1
CO2	Explain the modern communication used in the business.	K2
CO3	Summarise the process of report writing and develop the interview techniques.	K2, K3
CO4	Identify ethical, legal, cultural and global issues affecting business communication.	K3
CO5	Analyse the situation of writing various types of letters.	K4

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	2	3	3	3	3	2
CO2	2	3	3	3	3	2	2	3	3	2
CO3	2	3	3	3	3	3	2	2	3	2
CO4	2	3	3	3	3	3	2	2	3	2
CO5	2	3	3	3	3	2	2	2	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
“3”–Substantial (High) Correlation“-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Communication – Needs – Objectives – Communication Media – Process – Characteristics – Barriers of Communication – Steps to overcome barriers of Communication	12	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
II	Business letter – Needs – Function – Kinds of Business letter – Essentials of an Effective Business letter – Structure of Business letter – Letter of Enquiries and replies	12	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
III	Application letter – Preparation of Resume – Interview Meaning – Objective and Interview Techniques – Interviewee's Preparation for the Interview and Conduct during the Interview.	12	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
IV	Modern forms of Communication – Email Mechanics of an e-mail –Layout of e-mail Teleconference , voicemail – Internet – multimedia Teleconferencing – Mobile Phone – SMS – Telephone Answering machine.	12	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4
V	Reports – Introduction – Types – Preparation – Structure and Organization of reports – Reports by individuals and committees press releases.	12	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4,K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Circular letters – Objectives – Situations that need Circular letters – Sales letters – Bank Correspondence	-	CO1,CO2, CO3,CO4, CO5	K1, K2, K3,K4

Text Books

- Rajendra Pal , J.S. Korlahalli (2015). *Essentials of Business Communication*. Reprint. Sultan Chand & Sons.
- Sharma R. C, Krishna Mohan (2017). *Business Correspondence and Report Writing* . 6th Edition Tata Mc-Graw Hill.
- Subba Rao .P (2013). *Business Communication* . Reprint. Cengage Learning India..

Reference Books

4. Krishnamacharyulu, Lalitha. R (2018). *Business communication*. 3rd Edition. Himalaya Publishing House.
5. Mathur S. P (2017). *Business Communication*. 2nd Edition. New Age International Publishers.
6. Sundar K, Kumara Raj .A (2019). *Essentials of Business Communication*. Reprint. Vijay Nicole Imprints Private Limited.

Web Reference

6. <https://www.marketingtutor.net/communication-media-definition-types-examples/>
7. <https://www.vedantu.com/commerce/essential-qualities-of-a-good-business-letter>
8. <https://www.themuse.com/advice/the-ultimate-interview-guide-30-prep-tips-for-job-interview-success>
9. <https://www.yourarticlelibrary.com/business-communication/modern-forms-of-communication-fax-email-and-videoconferencing/27654>
10. <https://www.eapfoundation.com/writing/reports/structure/>

Pedagogy

Lecture, Power Point Presentation, Group discussion, Seminar and Assignment.

Course Designer

Mrs. D. Indumathi

M.Com

(2023-2024)

II Semester



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF COMMERCE
M.Com – PROGRAMME STRUCTURE
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the Candidates admitted from the Academic year 2023-2024 onwards)

II Semester

Semester	Course	Title	Course Code	Inst. Hrs./ week	Credit	Exam Hours	Marks		Total
							Internal	External	
II	Core Course – V (CC)	Cost and Management Accounting	22PCO2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Business Analytics	22PCO2CC6	6	5	3	25	75	100
	Core Course – VII (CC)	Economic and Environment Law	23PCO2CC7	6	5	3	25	75	100
	Core Choice Course – I (CCC)	A. Logistics and Supply Chain Management	23PCO2CCC1A	6	4	3	25	75	100
		B. Organizational Behaviour	23PCO2CCC1B						
		C. Brand Management	22PCO2CCC1C						
	Discipline Specific Elective Course – II (DSE)	A. Business Ethics, Corporate Social Responsibility and Governance	23PCO2DSE2A	6	3	3	25	75	100
		B. Retail Management	22PCO2DSE2B						
		C. Business Information System	22PCO2DSE2C						
	Internship	Internship	22PCO2INT		2				100
	Extra Credit Course	Swayam Online Course		As per UGC Norms					
		Total		30	24				600

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23PCO2CC7	ECONOMIC AND ENVIRONMENT LAW	CORE	6	5

Course Objectives

- To understand the concepts of Law.
- To enhance the knowledge related to various law in economic and environment.
- To analyze the various act, to protect the environment law.

Prerequisite

Basic knowledge in Economics and Environment Law.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Choose and relate the provisions, policies related to prevention of money exchange.	K1, K2
CO2	Select the concepts, provisions and to discuss the various policies relating to act.	K3
CO3	Choose and analyze the legal aspects of various acts and the disputes Redressal agencies, penalties and adjudication.	K3, K4
CO4	Compare and assess the latest amendments in various act, contraventions and penalties.	K4, K5
CO5	Explain the concepts of laws in detail and to relate where and how it is applied in recent days.	K5

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	3	2	2	3	3	3	2	3	2
CO3	3	3	2	3	2	3	3	2	3	3
CO4	3	3	2	3	3	2	3	3	3	3
CO5	3	3	3	3	3	2	3	3	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
“3”– Substantial (High) Correlation“-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Foreign Exchange Management Act, 1999 – Definition – Regulation and Management of Foreign Exchange – Authorized Persons – Contraventions and Penalties – Adjudication and Penalties – Directorate of Enforcement. Securities and Exchange of Board of India Act, 1992 (SEBI) – Functions and Powers.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4,K5
II	The Competition Act, 2002 – Introduction – Interpretation – MRTP Vs Competition Act – Scope – Prohibition of Certain Agreements, Abuse of Dominant position and Regulation of Combinations.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4,K5
III	Benami Transaction Prohibition (Act) – Benami Property – Benami Transaction, Prohibition, adjudication of Benami property – Prevention of Money Laundering Act, 2002.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4,K5
IV	The Environment Protection Act 1986 – Definition – powers of the Central Government to prevent and Control Environmental Pollutions – Appointing Officers. Consumer Protection Act 1986 – Definition – State and Central Consumer Protection Council – Disputes Redressal Agencies – District Forum – Appointment of Members – Appeal – State and Central Commission.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4,K5
V	Information Technology Act 2000 – Introduction – Definition – Digital Signature – Certificates – Electronic Governance – Regulations of Certifying Authorities – Duties of Subscriber – penalties and Adjudication – The Cyber Regulation Appellate Tribunal – Offences – Power of State and Central Government to make rules – Constitution of Advisory Committee.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4,K5

VI	Self-Study for Enrichment (Not to be included for External Examination) Comparison on provisions of Companies Act 1956 and Companies Amendment Act 2013 and causes for amendment – Competition commission of India – Prevention of Black Marketing and Maintenance of Supplies of Essential Commodities Act, 1980 – Telecom Regulatory Authority of India Act, 1997.		CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4,K5

Text Books

1. Sharma J.P.(2012). *Corporate Laws*. 2nd Edition. Ane Books Pvt.Ltd. New Delhi.
2. Daniel Albuquerque (2014). *Legal Aspects of Business*. 1st Edition. Oxford University. New Delhi.
3. Kuchhal M.C. (2018). *Mercantile Law*. 3rd Edition. Vikas Publishing House Pvt.Ltd.

Reference Books

1. Balachandran V, Thothadri S. (2013). *Legal Aspects of Business*. 1st Edition. Vijay Nicole Imprints Private Limited.
2. Kapoor G. K , Surl A.P. (2012). *Corporate Laws*. 3rd Edition. Taxman's Publications.
3. Kannel S, Sowrirajan V. (2009). *Company Law Procedure*. 1st Edition. Taxman's Publications.

Web Reference

1. http://legislative.gov.in/sites/default/files/A1999-42_0.pdf
2. http://www.indiacode.nic.in/bitstream/123456789/13116/1/it_act_2000_updated.pdf
3. http://ncdrc.nic.in/bare_acts/consumer%20protection%20act-1986.html
4. <https://www.indiacode.nic.in/bitstream/123456789/1840/2/A198845.pdf>
5. http://tumkuruniversity.ac.in/oc_ug/comm/organisation%20behaviour.pdf

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Capt. Dr. P. Kavitha

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23PCO2CCC1A	LOGISTICS AND SUPPLY CHAIN MANAGEMENT	CORE CHOICE	6	4

Course Objectives

- To know how logistic strategies fits into an organization's broader decisions, the role of logistic providers, and realize the meaning of customer service.
- To explain the strategic role of logistic and supply chain management in the cost reduction.
- To understand the components and processes of supply chain and logistics.

Prerequisite

Basic knowledge in Supply Chain Management

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and explain the basic concepts, role of Logistics and supply chain management in business.	K1,K2
CO2	Infer and identify how supply chain drivers play an important role in redefining value chain excellence of Firms	K2, K3
CO3	Apply and analyze the tools and techniques useful in implementing Logistics and supply chain management	K3, K4
CO4	Make use of logistics and supply chain strategies to create value generation and assess IT applications	K3, K5
CO5	Categorize and appraise the various supply chain strategies.	K4, K5

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	2	3	3
CO2	3	3	2	3	3	3	3	2	3	3
CO3	3	3	2	3	2	3	3	2	3	3
CO4	3	3	2	3	2	3	3	2	3	3
CO5	3	3	2	3	3	3	3	2	3	3

1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation – “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Logistics Management – Definition – Scope – Functions – Objectives of Integrated Logistics Management – Role of Logistics in Supply Chain. Logistics and Customer Service – Role of Logistics in Competitive Strategy – Logistics Organization and Performance Measurement – Reverse Logistics – Scope, Design.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Supply Chain – Objectives – Importance – Decision Phases – Process View – Competitive and Supply Chain Strategies – Achieving Fit – Supply Chain Drivers – Obstacles – Framework – Facilities – Inventory- Transportation – Information – Sourcing – Modeling for Supply Chain – Supply Chain Relationships – Channel Relationships - Dimensions – Approaches to study channels.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Designing the Distribution Network – Role of Distribution and Network – Factors Influencing Distribution – Design Options – E- Business and its impact – Distribution Network in Practice – Factors affecting Networking Design Decision Modeling.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	E-logistics – Logistics Information System – Supply Chain information System Modules - Application of IT in Logistics - Goals of IT for supply chain management - Decision support systems for SCM - IT and Customer value – Automatic Identification Technologies – Bar Coding, WMS, TMS, LMS, OMS, WCS, and RFID. Containerization – Concept – Benefits – Types of Carriers – Indirect and Special Carriers – Role of Intermediaries – Shipping Agents, Brokers – Freight management – Route Planning of Transports, ICDs, CONCOR – Global Shipping Options.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Ware house Management – Storage Functionality and Principles – Warehouse benefits – Types. Packing and Packaging: Meaning – Essentials and Functions – Packing for Storage – Overseas Shipment – Inland - Transportation – Product content Protection, Packaging Types - Sourcing-in-House or Outsourcing - 3 rd and 4 th PLS, GPS and GLS Technology, Supply Scoring and Assessment, Lean Management, Lean Manufacturing, Mass Customization.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self Study for Enrichment (Not to be included for End Semester Examinations) Basics of Transportation, Transportation Functionality and Principles - Multimodal Transport: Characteristics - Comparisons - International Air Cargo Transport - Coastal and Ocean transportation - Characteristics of shipping transport - Types of Ships.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Sunil Chopra, Peter Meindl, Dr.D.V Kalra (2016). *Supply Chain Management – Strategy*. 6th edition. Planning Operation. Prentice Hall. India.
2. Dr.L.Natarajan (2017). *Logistics and Supply Chain Management*. 1st edition. Margham Publications.
3. Sunil Sharma (2010). *Supply Chain Management Concepts. Practices and Implementation*. 1st edition. Oxford University Press.

Reference Books

1. Ailawadi C.Sathish, Rakesh Singh (2013). *Logistics Management*. 2nd Edition. Prentice Hall. India.
2. Agarwal D K (2003). *Logistics and Supply Chain Management*. 2nd Edition, Macmillan India Ltd. Lakshmi Publications.
3. Donald J, Bowersox, David J. Closs. M. Bixby Cooper (2017). *Supply Chain Logistics Management*. 2nd Edition. McGraw Hill Educations (India).

Web References

1. <https://www.googlesir.com/information-technologies-used-in-supply-chain>
2. <https://backup.pondiuni.edu.in/sites/default/files/Logistics%20Supply%20Chain%20Mgt200813.pdf>
3. https://www.tutorialspoint.com/supply_chain_management/supply_chain_management_tutorial.pdf
4. <https://www.mbacrystalball.com/blog/operations-management/logistics-scm/>
5. <https://courses.lumenlearning.com/suny-wmopen-introbusiness/chapter/supply-chain-management-and-logistics-2/>

Pedagogy

Lecture, Power Point Presentation, Assignment, Seminar, Group Discussions

Course Designer

Prof. Dr. N. Savithri

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23PCO2CCC1B	ORGANIZATIONAL BEHAVIOUR	CORE CHOICE	6	4

Course Objectives

- To understand and analyze the individual needs, feeling, aspirations.
- To develop skills needed to plan for the implementation of change in an organization.
- To identify the effective motivational and leadership skills.

Prerequisite

Basic knowledge in Human Resource Management.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and explain the concept of organizational behavior to understand the behaviour of people in the organization.	K1,K2
CO2	Infer and develop the Attitude, change of attitude and aspects of personality.	K2,K3
CO3	Categorize the complexities associated with management of the group behavior in the organization.	K4
CO4	Explain how the organizational behavior can integrate in understanding the motivation behind behaviour of people in the organization.	K4
CO5	Assess the Group behavioral influence in the organization.	K5

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” Indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Organizational Behaviour – Meaning – Definition – Concepts - Approaches – Characteristics – Scope – Limitations – Challenges and opportunities – Models of Organizational Behaviour.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
II	Personality: Meaning – Definition – Features – Types of Personality – Determinants of Personality – Big Five Model – MBTI – Managerial Implications of Personality. Perceptions: Meaning – Definition – Concepts – Features – Importance of perception – Factors affecting Perception – Process of Perception - Measures for improving perception.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
III	Learning: Meaning – Definition – Nature – Process – Factors – Learning Theories – Classical and Operant Conditioning – Differences – Reinforcement – Positive and Negative Reinforcement. Attitude : Meaning – Definition – Components – Characteristics – Types – Theories – Formation – Functions – Attitude Change – Methods of Attitude Change – Developing Positive attitude by individuals.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
IV	Motivation: Meaning – Definition – Concepts – Nature – Importance – Types – Motivation Process – Theories of Motivation. Leadership: Meaning – Definition – Concept – Importance – Qualities of good leader – Leadership Styles – Leadership Theories.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
V	Group Behaviour: Groups - Concept and Classification - Stages of Group Development – Group Structure – Roles and Norms – Premise and Issues – Group Decision Making : Group vs. individual – Group think and Group Shift – Techniques and Process – Conflict Management: Concept – Causes – Types – Stages – Effects – Management of Conflicts	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

VI	Self Study for Enrichment (Not to be included for External Examination) Stress Management - Concept of Stress - Sources and Effects of Stress on humans - Management Stress - Communication: Concept of Two - way and Open Communication, Transactional Analysis.		CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K 4,K5

Text Books

1. Prasad L.M. (2019). *Organisational Behavior*. 1st Edition. Sultan Chand & Sons.
2. Stephen P. Robbins (2018). *Organisational Behaviour*. 18th Edition. Pearson.
3. Aswathappa. K, (2016). *Organizational Behavior*. 4th Edition. Himalaya Publishing House. New Delhi.

Reference Books

1. Khanka.S.S (2006). *Organizational Behavior*. 2nd Edition. S. Chand Publishing.
2. Robbins, Stephen P. (2008). *Organizational Behavior*. 14th Edition. Prentice Hall. New Delhi.
3. Fred Luhans (2015). *Organizational Behaviour*. 13th Edition. McGraw Hill Book Company.

Web Reference

1. https://www.tutorialspoint.com/organizational_behavior/organizational_behavior_conflict_management.html
2. <https://www.sscasc.in/wp-content/uploads/downloads/BBM/Organizational- Behaviour>
3. http://www.tmv.edu.in/pdf/Distance_education
4. <https://edukedar.com/organisational-behaviour-syllabus/>
5. <https://edukedar.com/organisational-behaviour-syllabus/>

Pedagogy

Chalk and talk, Power Point Presentation, Discussion, Assignment, Seminar

Course Designer

Dr.S.Shameem

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23PCO2DSE2A	BUSINESS ETHICS, CORPORATE SOCIAL RESPONSIBILITY AND GOVERNANCE	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To familiar with the benefits of corporate social responsibility in the context of globalized economic and social relations.
- To outline the role of business ethics that influences the decision making process and its impact of corporate governance.
- To promotes a perceptive issues of ethics in all the areas of functional management along with the benefits of social responsibility.

Prerequisite

Basic knowledge in Business Ethics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define and outline the concepts of business ethics, corporate social responsibilities and governance.	K1, K2
CO2	Apply the ethical aspect of social responsibility and analyze its implications in various functional areas of business management.	K3, K4
CO3	Examine the legal provisions of the ethical policies of corporate social responsibility and governance.	K4
CO4	Evaluate the ethical practices in corporate social responsibility and governance.	K5
CO5	Discuss the issues and challenges in the field of business ethics, social responsibilities and governance in the current scenario.	K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Business Ethics : Meaning – Definition – Nature – Need – Importance, Benefits and Approaches –Work Ethics – personal and professional ethics in the organisation – discrimination, harassment gender equality – Internal and External Ethics of Business – Whistle blowing – Digital Business Ethics. Case Studies: Infosys Technologies – The best among Indian Corporations.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Marketing Ethics: Context of Indian Economy – Normative Marketing Ethics – Areas in Marketing Ethics. Ethical Issues in Human Resources – Scope – Different aspects – Emerging challenges of HRM – Role of HRM. Ethical Perspective of IT Industry – Fast changing face of Cyber Crimes – Protection from Cyber Criminals. Case Studies: Credit Card Data Fraud, Cyber Crimes – the Glitches Amidst the glow.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	Corporate Governance: Meaning – Definition – Significance – Principles, Theories of Corporate Governance: Agency, Stewardship and Stakeholder – Comparative analysis of Corporate Models of Governance, Distinguish between Corporate Governance and Management – Four Pillars of Corporate Governance – Good Corporate Governance. Case Studies: Tata Steel – A Company which produces the best Steel in Indian Corporations.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
IV	Meaning – Corporate Philanthropy – CSR an Overlapping Concept – Corporate sustainability Reporting – CSR through Triple Bottom Line – CSR and Business Ethics – CSR and Corporate Governance – Environmental aspect of CSR – CSR Models – Drivers of CSR – Global Reporting Initiatives – Major Codes on CSR – Initiatives in India Case Studies : Dr. Reddy’s Laboratories – Commitment to All Round Corporate Excellence.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

V	Growth of global corporations – Factors facilitating Globalization – Role of MNC's – Benefits of MNC's to Host Nation – Challenges of Globalization in the context of Growing Market – Key Global Issues for Business Case Studies: Sterlite – using Money Clout to Maximum Advantages.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examination) Professional Ethics - Ethics in Retrenchment - Global Market-Contemporary Technology - Corporate democracy- Governance Mechanisms.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Fernando. A.C. (2012). *Business Ethics – An Indian Perspective*. 3rd Edition. Pearson Education in south Asia Pvt. Ltd.
2. Saha.P.K. (2009). *Business Ethics*. 3rd Edition Pacific Publication. New Delhi.
3. Khanka.S.S. (2014). *Business Ethics and Corporate Social Responsibility*. 6th Edition Sultan Chand & Company.

Reference Books

1. Parveen Parboteeah K, John B.Cullen, (2012). *Business Ethics*. 5th Edition. Routledge.
2. John R. Boatright, Bibhu Prasan Patra, (2011). *Ethics and Conduct of Business*. 6th Edition, Pearson.
3. Ferrell. O.C, Fraedrich, John, Ferrell, Linda. (2018). *Business Ethics, Ethical Decision Making & Cases*. 10th Edition. Cengage learning.

Web References

1. <http://www.businessethics.ca/>
2. <https://www.investopedia.com/terms/b/business-ethics.asp>
3. <https://business-ethics.com/>
4. <https://www.csr.gov.in/content/csr/global/master/home/home.html>
5. <https://www.investopedia.com/terms/c/corporategovernance.asp>

Pedagogy

PPT, Discussion, Assignment, Quiz, Seminar

Course Designers

Dr. D. Ramya

M.Com
(2022-2023)
IV Semester



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF COMMERCE
M.Com. – PROGRAMME STRUCTURE
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the candidates admitted from the academic year 2022 – 2023 onwards)

IV Semester

Semester	Course	Title	Course Code	Inst. Hrs./ week	Credit	Exam Hours	Marks		Total
							Internal	External	
IV	Core Course – X (CC)	Business Taxation	22PCO4CC10	6	5	3	25	75	100
	Core Course – XI (CC)	Research Methodology	22PCO4CC11	6	5	3	25	75	100
	Core Choice Course – III (CCC)	A. Enterprise Resource Planning	22PCO4CCC3A	6	4	3	25	75	100
		B. Managerial Behaviour and Effectiveness	22PCO4CCC3B						
		C. Corporate Tax Planning	22PCO4CCC3C						
	Generic Elective Course – II (GEC)	Financial Mathematics	22PCO4GEC2	3	2	3	25	75	100
	Project	Project Work	22PCO4PW	9	5				100
		Total		30	21				500

Semester IV	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCO4CC10	BUSINESS TAXATION	CORE	6	5

Course Objectives

- To help the students understand and apply basic concepts and provisions of Income Tax Act 1961.
- To lay down a foundation for computing gross total income and total tax liability.
- To provide adequate knowledge in the application of Goods and service tax in day to day business.

Prerequisite

Basic knowledge in Taxation

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and infer the basic concepts, definitions and terms related to Income Tax and GST.	K1,K2
CO2	Identify and categorize the income under various heads namely income from salaries, house property, business/ profession, capital gains and income from other sources.	K3,K4
CO3	Analyze and evaluate the working knowledge on the computation of total income and tax payable by an individual.	K4,K5
CO4	Appraise the procedure for assessment of income tax and discuss the implications of GST.	K5,K6
CO5	Formulate the e-filing system and its process.	K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	2	3	3
CO2	3	3	2	3	3	3	3	2	3	3
CO3	3	3	2	3	2	3	3	2	3	3
CO4	3	3	2	3	2	3	3	2	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Income Tax Act 1961- Definitions – Types of Taxes, Cannons of taxation- Income – Agricultural Income - Person – Assessee – Types of Assessee - Previous Year – Assessment Year – Residential Status – Scope of Total Income – Capital and Revenue Receipts and expenditure – Incomes exempt under Sec.10.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Computation of Income from Salaries – Annual accretion – allowances – Gratuity – Pension – Leave salary - perquisites – types and treatment – profit in lieu of salary – exempted profits – deduction u/s 16 - Provident fund – Types.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	Computation of Income from House Property – determination of GAV, NAV – deduction out of annual value- Exempted income from house properties, treatment of unrealized rent and vacancy. Profits and Gains of business or profession – meaning – computation - expenses expressly allowed – expenses expressly disallowed.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
IV	Computation of Capital Gain – cost of acquisition – cost of improvement – exempted capital gain – tax on capital gain - Computation of income from other sources – specific incomes and other incomes chargeable under the head income from other sources. Set off and carry forward of losses.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
V	Income tax Authorities – Procedure for assessment – Tax Deducted at Source (TDS)- Deduction from Gross total income – Total tax liability - GST – History – Formation and launch – Tax - GST Council – Goods and Service Tax Network (GSTN) – Criticism – Application of GST -	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

	Introduction to e-filing.			
VI	Self Study for Enrichment (Not to be included for End Semester Examinations) Assessment of Individual, Hindu Undivided Family, Partnership firms and companies		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

Distribution of Marks: Theory 25% and Problem 75%

Text Books

1. Murthy A. (2023). *Income Tax*. Vijay Nicole Chennai. Current Edition.
2. Dr.Mehrotra.H.C. (2023). *Income Tax Law and Practice*. Sahithya Bhavan Publications. Current Edition.
3. Chaarlas.L.J. (2022). *Essenhtials of Goods and Srvices Tax (GST)*. Latest Edition. Vijay Nicole Imprint Private Limited.

Reference Books

1. Gaur.V.P. D, Narang.D.B, Puja Gaur, Rajeev Puri (2023). *Income Tax Law and Practice*. Current Edition. Kalyani Publishers.
2. Reddy.T.S, Hari Prasad Reddy. (2023).*Income Tax Law and Practice*. Current Edition. Margham Publications.
3. Vinod K Singhania, Monika Singhania.(2023). *Income Tax*. Current Edition. Taxmann Student's Guide.

Web References

1. <https://incometaxindia.gov.in/Tutorials/11.Tax%20free%20incomes%20final.pdf>
2. <https://tax2win.in/guide/how-to-calculate-income-tax-on-salary>
3. <https://scripbox.com/tax/income-on-profits-from-business-or-profession/>
4. <https://egyankosh.ac.in/bitstream/123456789/66991/3/Unit-16.pdf>
5. <https://cleartax.in/s/gst-law-goods-and-services-tax>

Pedagogy

Lecture, Power Point Presentation, Assignment, Seminar, Group Discussions

Course Designer

Prof. Dr. N. Savithri

Semester IV	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCO4CC11	RESEARCH METHODOLOGY	CORE	6	5

Course Objectives

- To provide theoretical and practical preparation for business research
- To demonstrate the ability to choose methods appropriate to research aims and objectives.
- To develop skills in qualitative and quantitative data analysis and presentation.

Prerequisite

Basic knowledge in Research Methodology

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall and explain the basic concepts in research methodology and combine them in research.	K1,K2
CO2	Outline and identify the complex issues inherent in selecting a research problem, selecting an appropriate research design, and implementing a research project.	K2, K3
CO3	Apply and analyse the concepts and procedures of sampling, data collection, analysis and reporting.	K3, K4
CO4	Determine the range of quantitative and qualitative research techniques to business and management problems and issues.	K5
CO5	Assess the overall process of designing a research study from its inception to its report.	K5

Mapping of CO with PO and PSO

Os / SOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
O1	3	3	2	3	2	3	3	2	3	3
O2	3	3	2	3	3	3	3	2	3	3
O3	3	3	2	3	2	3	3	2	3	3
O4	3	3	2	3	2	3	3	2	3	3
O5	3	3	2	3	2	3	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
 “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Research methodology – Definition - Role and Objectives - Application and Types of Research- Research Process and steps – Collecting and Reviewing the Literature, Conceptualization and Formalization of Research Problem.	18	CO1, CO2, CO3, CO4 CO5	K1,K2,K3, K4,K5
II	Research Design - Need for Research design – Features of good Research design – Types – Explorative - Descriptive – Experimental and Diagnostic research - Design of Sample Survey – Census Vs. Sample enumeration – Objectives and Principles of sampling - Types of Sampling - Sampling and Non sampling Errors – Sample size.	18	CO1, CO2, CO3, CO4 CO5	K1,K2,K3, K4,K5
III	Data Collection Analysis - Primary and Secondary Data – Designing Questionnaire and Interview Schedule – Pretesting – Pilot Study – Scale of Measurement – Nominal – Ordinal – Internal and Ratio Scale.	18	CO1, CO2, CO3, CO4 CO5	K1,K2,K3, K4,K5
IV	Data Coding in SPSS – Selection of Tools for Analysis – Testing of Hypothesis – Parametric and Non parametric Tests – T Test – ANOVA – Chi Square Test – U Test – K Test – H Test – Fredman Test – Multivariant Analysis – Correlation – Regression.	18	CO1, CO2, CO3, CO4 CO5	K1,K2,K3, K4,K5
V	Report Writing – Types – Contents – Styles – Steps in Drafting Reports – Footnotes and Bibliography Writing – Checking Plagiarism – Ethics in Research – Ethical Behavior – Social Implication and Practical Implication in	18	CO1, CO2, CO3, CO4 CO5	K1,K2,K3, K4,K5

	Research Report.			
VI	Self Study for Enrichment (Not to be included for End Semester Examinations) Reference Management Software like Zotero, Mendeley, and Software for paper formatting like LaTeX, MS Office, Software for detection of Plagiarism.		CO1, CO2, CO3, CO4 CO5	K1,K2,K3, K4,K5

Text Books

1. Kothari.C.R., Garg.G. (2023). *Research Methodology: Methods and Techniques*. 5th Edition. New Age International.
2. Ravilochanan.T. (2018). *Research Methodology With Business and Report Writing*. Revised Edition. Margham Publications.
3. Deepak Chawla, Neela Sondhi.(2016). *Research Methodology*. Revised Edition. Vikas Publishing(P)Ltd.

Reference Books

1. Pannerselvam.R. (2014). *Research Methodology*. 2nd Edition. PHI Learning.
2. Gupta.B.N, Nitin Gupta. (2021). *Research Methodology*. 1st Edition. SPBD Publication
3. Asthana.H.S, Bhushan.B. (2016). *Statistics for Social Sciences (With SPSS Applications)*. 2nd Edition. PHI Learning.

Web References

1. <https://www.questionpro.com/blog/research-design/>
2. <https://www.scribbr.com/methodology/sampling-methods/#>
3. <https://www.formpl.us/blog/research-report>
4. <https://ccsuniversity.ac.in/bridge-library/pdf/Research-Methodology-CR-Kothari.pdf>
5. <https://eduvoice.in/types-research-methodology/>

Pedagogy

Lecture, Power Point Presentation, Assignment, Seminar, Group Discussions

Course Designer

Ms. N. Aruna

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCO4CCC3A	ENTERPRISE RESOURCE PLANNING	CORE CHOICE	6	4

Course Objectives

- To understand how a business work and how information systems fit into business operations.
- To gain insight on the evolution and basics of Enterprise Resource Planning (ERP) and its technologies.
- To train the students to develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth.

Prerequisite

Basic knowledge in Entrepreneurship Development.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and explain the need of business system and processes through strategic analysis of ERP system.	K1, K2
CO2	Classify and apply the concept of ERP implementation system.	K2, K3
CO3	Identify and analyze the various technical aspects of ERP and its Modules.	K3, K4
CO4	Categorize and explain the steps and activities in the ERP life cycle.	K4, K5
CO5	Assess the theoretical approach on strategies to be resumed for a successful ERP process.	K5

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3	3	3	2	3	3
CO2	3	3	2	2	3	3	3	3	3	3
CO3	3	3	3	2	3	3	2	3	2	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	2	3	3	2	3	2	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation

“3”–Substantial (High) Correlation“-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	ERP – Meaning – Definition – History and Evolution – Component of ERP – Need – Functions – Role of ERP – Characteristics – Importance – Features – Purpose of ERP – ERP Vs. Traditional Information Systems – Basic constituents of ERP – Procurement – Process – Types – Risks and Governance Issues in an ERP – Limitation of ERP - Benefits of ERP.	18	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5
II	Finance – Manufacturing – HR Process – Plant maintenance – Materials Management – Accounting in ERP - Quality management – Marketing – Sales, distribution and service.	18	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5
III	Objectives of ERP Implementation – ERP Implementation life cycle – Challenges to Implementation – Implementation strategy – Benefits realized in ERP Implementation – Reason for failure of ERP Implementation.	18	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5
IV	CRM – Meaning – Definition – Importance – Phases – Challenges – Benefits – Uses – Characteristics – CRM Software – Limitations.SCM – Meaning – Definition – Objective – Process – Challenges – Supply chain decision – Benefits – Scope of SCM.	18	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5
V	New trends in ERP – E-Commerce – Future directives in ERP – ERP and Internet – Critical success factors – Integrating ERP into organizational culture – ERP and E-business Process Business Reengineering (BPR) .	18	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Management Information System (MIS) – Data warehousing – Data Mining – Online Analytical Processing – Advanced technology and ERP Security.		CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5

Text Books

1. Leon, Alexis. (2014). *ERP Demystified*. 3rd Edition. Tata Mc Graw Hill Publishing Company Ltd. Chennai.
2. Dr.Rizwan Ahmed.P. (2015). *Enterprise Resource Planning*. Revised Edition. Margham Publications.
3. Nirupma Pathak, Sanchita Ghatak, Satyendra K Singh. (2012). *Enterprise Resource Planning*. Revised Edition, Himalaya Publishing House.

Reference Books

1. Vinod Kumar Venkitakrishnan. Garg.N.K. (2011). *Enterprise Resource Planning: Concepts and Practices*. Revised Edition. Prentice Hall of India.
2. Singla, Ashim Raj (2022). *Enterprise Resource Planning*. 2nd Edition. Prentice Hall of India.
3. Parthasarathy. (2014). *Enterprise Resource Planning – Managerial and Technical Perspective*. Revised Edition, New Age International Publishers. New Delhi.

Web Reference

1. <https://www.investopedia.com/terms/e/erp.asp>
2. <https://www.netsuite.com/portal/resource/articles/erp/what-is-erp.shtml>
3. <https://www.cio.com/article/272362/what-is-erp-key-features-of-top-enterprise-resource-planning-systems.html>
4. <https://www.gartner.com/en/information-technology/glossary/enterprise-resource-planning-erp>
5. <https://www.cengage.co.in/category/test-prep/ebook>

Pedagogy

Lecture, Power Point Presentations, Group Discussion, Seminar, Quiz, Assignment, Experience Discussion, Brain Storming, Activity.

Course Designer

Dr.S.Sudha

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCO4CCC3B	MANAGERIAL BEHAVIOUR AND EFFECTIVENESS	CORE CHOICE	6	4

Course Objectives

- To understand the various managerial skills, roles functions and levels.
- To gain the knowledge of traditional and contemporary structural designs.
- To identify various leadership styles and their suitability to the situation.

Prerequisite

Basic knowledge in Organizational Behaviour.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and classify the managerial dimensions for effective job behavior.	K1,K2
CO2	Identify the managerial styles in terms of concern for production and people.	K3
CO3	Construct and analyze the different systems of management and relate these systems to organizational characteristics.	K3,K4
CO4	Categorize the managerial skills to enhance the competitive spirit through creativity and innovation.	K4
CO5	Determine the essential skills needed for each individual, in reaching the winning edge.	K5

Mapping of CO with PO and PSO

COs/ PSO5	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation

“3”–Substantial (High) Correlation“-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Descriptive Dimensions of Managerial Jobs – Methods – Model – Time Dimensions in Managerial Jobs – Effective and Ineffective Job behavior – Functional and level differences in Managerial Job behavior.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5
II	Identifying Managerial Talent – Selection and Recruitment – Managerial Skills Development – Pay and Rewards – Managerial Motivation – Effective Management Criteria – Performance Appraisal Measures – Balanced Scorecard – Feedback – Career Planning – Characteristics – Distinction between Career Planning and Manpower Planning - Succession Planning – Analyzing Career Opportunities – Evaluation of Career Planning – Career Management.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5
III	Concept of Managerial Effectiveness - Definition – Person, process, product approaches – Bridging the Gap – Measuring Managerial Effectiveness – Causes of Effectiveness - Current Industrial and Government Practices in the management of Managerial Effectiveness – The Effective Manager as an optimizer – Factors Influencing Organizational Effectiveness.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Environmental Issues in Managerial Effectiveness – Organizational Processes – Organizational Climate – Leader – Group Influences – Job Challenge – Competition – Managerial Styles.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Developing the winning edge – Organizational and Managerial Efforts – Self Development – Negotiation Skills – Development of the Competitive Spirit – Knowledge Management – Fostering Creativity and Innovation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self Study for Enrichment (Not to be included for External Examination) Organizational Conflict - Different Stages of conflicts – Positive Aspects – Levels of Conflicts – Conflict outcomes.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Milkovich, Newman. (2017). *Compensation*. Revised Edition. McGraw – Hill International.
2. Blanchard, Thacker (2012). *Effective Training Systems*. Revised Edition. Pearson
3. Omkar.R.M. (2016). *Personality Development and Career Management*. Revised Edition. S.Chand

Reference Books

1. Dubrin. (2015). *Leadership, Research Findings, Practices and Skills*. Revised Edition. Biztantra.
2. Richard L.Daft (2017). *Leadership*. Revised Edition. Cengage
3. Joe Tidd, John Bessant, Keith Pavitt (2006). *Managing Innovation*. 3rd Edition .Wiley

Web Reference

1. <https://www.indeed.com/career-advice/career-development/techniques-of-management>
2. https://www.brainkart.com/article/Identifying-Managerial-Talent_7030/
3. <https://www.indeed.com/career-advice/career-development/manager-effectiveness>
4. <https://www.coursehero.com/file/45977102/Unit-IVpptx/>
5. https://www.brainkart.com/article/Developing-the-Winning-Edge_7053/

Pedagogy

Lecture, Power Point Presentations, Group Discussion, Seminar, Quiz, Assignment, Experience Discussion and Activity.

Course Designer

Dr.S.Jayalakshmi

Semester IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCO4CCC3C	CORPORATE TAX PLANNING	CORE CHOICE	6	4

Course Objectives

- To familiarize the students with major latest provisions of Indian tax laws and related judicial pronouncements pertaining to corporate world.
- To sensitize the students to recognize tax planning opportunities for developing appropriate tax strategies required in corporate decision making.
- To enable the learners to do effective tax planning to reduce tax liability of companies.

Prerequisite

Basic knowledge in Corporate Tax

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	On the successful completion of the course- students will be able to Explain how to claim relief in case of double taxation of income.	K2
CO2	Apply strategies for tax planning in respect of a new business- understands the specific tax issues for start-ups- and comprehend the Income Tax provisions relevant for financial management decisions.	K3
CO3	Construct and Examine the implications of Tax concessions and incentives in setting up of new Business unit.	K3, K4
CO4	Analyse the various tax planning concepts and procedure of assessment of corporate assesses.	K4
CO5	Determine the tax planning with reference to business restructuring.	K5

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	2	2	3	3	2	3	2
CO3	3	2	3	2	3	2	3	3	3	2
CO4	3	3	3	3	3	3	3	2	3	3
CO5	3	3	2	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation
“3”–Substantial (High) Correlation“-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction of Tax Planning: Meaning – objectives - methods - nature and scope of tax planning - tax evasion - tax avoidance – difference between tax evasion and avoidance - Justification of corporate tax planning and management.	18	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5
II	Assessment of Companies: Residential Status and incidence of Tax - Computation of taxable income of companies- Computation of corporate tax - Deductions available to corporate assesses - Computation of amount of corporate tax liability - Minimum Alternate Tax - Tax on distributed profits of domestic companies - Tax on income distributed to unit holders.	18	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5
III	Tax Planning and Specific Management Decisions: Implications of Tax concessions and incentives for corporate decisions in respect of setting up a new business - location of business and nature of business.	18	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5
IV	Tax Planning and Financial Management Decisions: Capital structure decisions - Dividend Policy - Bonus Share - Investments and Capital Gains. Owning or leasing of an asset - purchase of assets by instalment system and Hire System - Purchase of an asset out of own funds or out of borrowed capital- manufacturing or buying; Repairing- replacing - renewing an asset - Sale of assets used for scientific research - Shutting down and continuing operations.	18	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5

V	Business Reorganisation: Tax Planning in respect of amalgamation or de-merger of companies - Slump sale - conversion of a firm into a company. Conversion of Sole Proprietorship into Company - Conversion of company into Limited Liability Partnership.	18	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Foreign collaborations and incidence of taxation on domestic companies - provisions for relief in respect of double taxation.		CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5

Text Books

1. Girish Ahuja and Ravi Gupta. (2023). *Simplified Approach to Corporate Tax Planning & Management (Bharat Law House)*. Revised Edition.
2. Singhanian. V. K , Singhanian Monica. (2023). *Corporate tax planning and Business tax procedures*, Revised Edition. Taxmann publications.
3. Srinivas E. A. (2023). *Corporate Tax Planning*, Current Edition. Tata McGraw Hill.

Reference Books

1. Girish Ahuja and Ravi Gupta (2014). *Corporate Tax Planning & Management*. Revised Edition. Bharat Law House.
2. Rajeev Puri, Puja Gaur. (2018). *Corporate Tax Planning and Management*, Revised Edition. Kalyani Publishers.
3. Aggarwal. K.(2023). *Direct Tax Planning and Management*, Current Edition. Atlantic Publications.

Web Reference

1. [Corporate Tax Planning Detailed Notes for UGC NET Commerce Exam \(testbook.com\)](https://testbook.com).
2. [Corporate Tax Planning Notes.pdf - Google Drive](#).
3. <https://rccmindore.com/wp-content/uploads/2015/06/Tax-Planning-and-Management.pdf>
4. https://ebooks.lpude.in/commerce/mcom/term_4/DCOM508_CORPORATE_TAX_PLANNING.pdf
5. http://www.wbnsou.ac.in/online_services/SLM/PG/MCOM-16.pdf

Pedagogy

Lectures- Class Discussion- Power Point Presentation- Case study.

Course Designer

Dr. P. Banu.

Semester IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCO4GEC2	FINANCIAL MATHEMATICS	GENERIC ELECTIVE	3	2

Course Objectives

- To acquire an in depth understanding in mathematics, commerce and economics.
- To identify the mathematical properties and relations between concepts of financial and currency markets in investment and other economic activities.
- To gain knowledge on different models of Financial Markets.

Prerequisite

Basic knowledge in Business Mathematics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and summarize the mathematical properties and relations between economic activities and financial and banking sectors.	K1,K2
CO2	Apply different types of interest.	K3
CO3	Examine the financial application used for business decision.	K4
CO4	Categorize and assess the principles underlying the securities that are available in the financial markets.	K4,K5
CO5	Explain the value of securities and risk.	K5

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	3	3	2	2	2
CO3	3	2	2	3	3	3	3	3	2	3
CO4	3	2	2	3	3	3	3	3	2	3
CO5	3	2	2	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation □ “2” – Moderate (Medium) Correlation

“3”–Substantial (High) Correlation “-”Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Mathematical introduction, Growth and decay curves - Simple interest, bank discount, Compound interest, discrete compounding and frequency of interest. (simple problems only) Economic equivalence - Uniform series - Linear gradient series - Geometric gradient series - Complex (random) cash flows. (Economic equivalence - only theory).	9	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5
II	Depreciation and Depletion - Meaning and causes of depreciation - Methods of depreciation - Straight line method, Reducing balance method. Depletion base - depletion rate per unit - Computation of depletion and depreciation charge. (simple problems only)	9	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5
III	Breakeven analysis – importance, formulae for break even analysis, P/V ratio, margin of safety. (simple problems only) Stocks and bonds -Valuation of bonds - features - present value of a bond - perpetual bonds - Zero-coupon bonds. Stock Valuation - Constant Dividend Growth Rate Model - Supernormal Growth Stocks.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4, K5
IV	Cost of capital - features, importance, approaches of cost of capital, measurement of cost of capital. (simple problems only)	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Ratio analysis – liquidity ratio, leverage ratio, profitability ratio, operating ratio. (simple problems only) Decision under risk & uncertainty, Risk premium, Portfolio diversification.(only theory)	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self Study for Enrichment (Not to be included for External Examination) Depreciation - Annuity method, Leverage , Method of comparison of alternatives, Project balance, and computation of overall cost of capital, Credit and loan, Cost of credit and amortization, Rate-of-Return and Required Rate-of-Return, Mutual funds, Options, Insurance policies Life Insurance, Endowment and annuities.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Distribution of Marks: Theory 25% and Problem 75%

Text Books

1. Dr. Sharma F. C, Dr. Singh R. U. (2021). *Financial Management*. Revised Edition. SBPD Publication.
2. Serge MOULIN.(2021). *Basics of Financial Mathematics*. Revised Edition. Lulu.com.
3. Dr.Gupta S.P, Dr. Sushil Kumar Jain. (2022). *Financial Mathematics*. Revised Edition. Sahitya Bhawan Publication.

Reference Books

1. Pandey.I.M. (2021). *Financial Management*. Twelfth Edition. Pearson.
2. Marek Capinski. Tomasz Zastawniak. *Mathematics for Finance*. Springer.
3. Ambad Nazri Wahidudin. *Financial Mathematics and its Applications*. Ventus Publishing APS.

Web References

1. <https://www.du.edu.eg/upFilesCenter/exStore/eng/1610477841.pdf>
2. <https://openpress.usask.ca/engecon/chapter/3-4-equations-of-economic-equivalence/>
3. <https://www.accountingformanagement.org/depletion-method-of-depreciation/>
4. <https://mmhapu.ac.in/doc/eContent/Management/RaisAhmadKhan/May2020/BREAK-EVEN%20ANALYSIS%20UNIT%20II.pdf>
5. <https://www.scranton.edu/faculty/hussain/teaching/mba503c/MBA503C03.pdf>

Pedagogy

Lecture, Power Point Presentations, Group Discussion, Seminar, Quiz, Assignment, Experience Discussion and Activity.

Course Designer

Dr.S.J.Sureya

ANNEXURE G

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with 'A' Grade by NAAC

ISO 9001:2015 Certified

**PG AND RESEARCH DEPARTMENT OF
MATHEMATICS**



**B.Sc., MATHEMATICS
AUTONOMOUS SYLLABUS
(2023-2024 and ONWARDS)**

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS

VISION

To strive for excellence in the mathematical sciences in addition to encourage people to undertake opportunities in transdisciplinary domains.

MISSION

- To enhance analytical and logical problem-solving capabilities.
- To provide excellent mathematical science knowledge for a suitable career and to groom students for national prominence.
- To teach students how to use data analytics.
- To prepare students for transdisciplinary research and applications.
- Value-based education and service-oriented training programmes are used to acquire life skills.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc Mathematics, B.Sc Physics,
B.Sc Chemistry PROGRAMME

After completing a B.Sc., programme, a learner will be able to

PO NO.	On completion of B.Sc Mathematics / B.Sc Physics / B.Sc Chemistry Programme, the students will be able to
PO1	DOMAIN KNOWLEDGE Analyse, design and develop solutions by applying from fundamental concepts of basic sciences and expertise in discipline.
PO2	PROBLEM SOLVING Ability to think abstractly, to evaluate and concentrates effectively on problem-solving, as well as knowledge of global challenges.
PO3	CREATIVE THINKING AND TEAM WORK Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO4	EMPLOYABILITY Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO5	LIFE LONG LEARNING Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc
MATHEMATICS

PSO NO.	The Students of B.Sc Mathematics will be able to	POs Addressed
PSO1	Procure a precise understanding of the mathematical concepts.	PO1, PO3
PSO2	Excel by enhancing interpersonal skills, overcoming procedural challenges and intending career paths.	PO3, PO4
PSO3	Recognize, strengthen and analyse mathematical problems in order to acquire better conclusion.	PO4, PO5
PSO4	Manipulate numerical abilities across a variety of domains.	PO2, PO5
PSO5	Develop and desire to learn more about advanced mathematics and its applications.	PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS PROGRAMME STRUCTURE
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)
 (For the candidates admitted from the Academic year 2023-2024 Onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total	
							Hrs.	Marks			
								Int	Ext		
I	I	Language Course-I (LC)	பொதுத்தமிழ் - I	23ULT1	6	3	3	25	75	100	
			Hindi ka Samanya Gyan our Nibandh	23ULH1							
			Poetry, Grammar and History of Sanskrit Literature	23ULS1							
			Foundation Course: Paper I- French I	23ULF1							
	II	English Language Course – I (ELC)	General English-I	23UE1	6	3	3	25	75	100	
	III	Core Course – I (CC)	Algebra and Trigonometry	23UMA1CC1	4	4	3	25	75	100	
		Core Course – II (CC)	Differential Calculus	23UMA1CC2	5	4	3	25	75	100	
		First Allied Course – I (AC)	Mathematical Statistics	23UMA1AC1	5	4	3	25	75	100	
		First Allied Course – II (AP)	Programming Language using MATLAB (P)	23UMA1AC2P	2	2	3	40	60	100	
	IV	Ability Enhancement Compulsory Course-I (AECC)	Value Education	23UGVE	2	2	-	100	-	100	
	Total				30	22				700	
II	I	Language Course-II (LC)	பொதுத்தமிழ் -II	23ULT2	6	3	3	25	75	100	
			Hindi Literature and Grammar-II	22ULH2							
			Prose, Grammar and History of Sanskrit Literature	23ULS2							
			Basic French-II	22ULF2							
	II	English Language Course – II (ELC)	General English-II	23UE2	6	3	3	25	75	100	
	III	Core Course – III (CC)	Differential Equations and Laplace Transforms	23UMA2CC3	4	4	3	25	75	100	
		Core Course – IV (CC)	Integral Calculus	23UMA2CC4	4	4	3	25	75	100	
		Core Practical –I (CP)	Statistics with Excel (P)	23UMA2CC1P	2	2	3	40	60	100	
		First Allied Course – III (AC)	Applied Statistics	23UMA2AC3	4	3	3	25	75	100	
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100	
		Ability Enhancement Compulsory Course-III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100	
	Extra Credit Course		SWAYAM		As per UGC Recommendation						
	Total				30	22				800	

Note:

Part – I-Language – Tamil/Hindi/French/Sanskrit

Part – II- English

List of Allied Courses:

Allied Course I- Mathematical Statistics

Allied Course II- Computer Science

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory& Practical)	16+1	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV- Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
		44		150

The Internal and External marks for Theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

FOR THEORY:

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks].

The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks].

FOR PRACTICAL:

The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks].

The passing minimum for University Examinations shall be 40% out of 60 marks [i.e. 24 marks].

CORE COURSE – III (CC)
DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS
(2023-2024 Onwards)

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
23UMA2CC3	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	CORE	4	4

Course Objective

- **Explain** the basics of Ordinary Differential Equations.
- **Evaluate** in the field of Partial Differential Equations.
- **Explore** the mathematical methods formatted for major concepts.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain various notions in ODE, PDE, Laplace transforms.	K1,K2
CO2	Classify the problem models in the respective area.	K3
CO3	Identify the properties of solutions in the field of mathematics.	K3
CO4	Solve various types of problems involving differential equations.	K3
CO5	Analyze the applications of the Differential equations in practical life.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	3
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Equations of the first order but of higher degree: Equations solvable for dy/dx – Equations solvable for y – Equations solvable for x – Clairaut's form – Extended form of Clairaut's form – Exact differential equations – Conditions of integrability of $M dx + N dy = 0$ – Practical rule for solving an exact differential equation – Rules for finding integrating factors - simple problems.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Linear equations with constant coefficients: Definition – The operator D – Complementary function of a linear equation with constant coefficients – Particular integral – General method of finding P.I. – Special methods for finding P.I. of the forms e^{ax} , $\cos ax$ or $\sin ax$, $e^{ax} V$, x^m – Linear equations with variable coefficients – Methods of finding particular integrals – Method of Variation of Parameters.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Partial differential equations of the first order: Classification of Integrals – Derivation of partial differential equations – By elimination of constants – By elimination of an arbitrary function – Lagrange's method of solving the linear equation – Special methods for some standard forms $F(p, q) = 0$, $F(x, p, q) = 0$, $F(y, p, q) = 0$, $F(z, p, q) = 0$, $f_1(x, p) = f_2(y, q)$ Clairant's form – Equations reducible to the standard forms – Charpit's method .	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Laplace transforms Definition – Piecewise continuity – Sufficient conditions for the existence of the Laplace Transforms – Basic results – Laplace Transform of periodic functions – Some general theorems & simple applications – Evaluation of certain integrals using Laplace Transform	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Inverse laplace transforms:	15	CO1,	K1,

	The Inverse Transforms –Modification of results in Laplace Transform to get the inverse Laplace Transform - Use of Laplace Transforms in solving ODE with constant coefficients – The Laplace transform can also be used to solve systems of differentiable equations- Laplace transforms can be used to solve differential equations with variable coefficients.		CO2, CO3, CO4, CO5	K2, K3, K4, K5
VI	Self Study for Enrichment: (Not included for End Semester Examination) Equations that do not contain x explicitly- Equations that do not contain y explicitly - Special method of evaluating the P.I. when X is of the form x^m –Solving of few standard forms from Charpit's method - Certain equations involving integrals can also be solved by Laplace transform.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Narayanan, S and Manicavachagom Pillay, T.K (2016). *Differential Equations And Its Applications*.S.Viswanathan Publishers Pvt. Ltd.

Chapters and Sections

- UNIT-I Chapter IV: Sections 1 – 3.
Chapter II: Section 6.
- UNIT-II Chapter V: Sections 1-5 (Omit 5.5).
Chapter VIII: Section 4.
- UNIT-III Chapter XII: Sections 1-6.
- UNIT- IV Chapter IX: Sections 1-5.
- UNIT- V Chapter IX: Sections 6-10.

Reference Books

1. Raisinghania M.D. (2008). *Ordinary and Partial Differential Equations*.S.Chand & Company.

2. Zafar Ahsan.(2006). Differential Equation and Their Applications(Second Edition). Prentice Hall of India Private Limited.
3. Dr.S.Arumugam, A Thangapandi Isaac (2014). Differential Equations and Applications. New Gamma Publishing House.

Web References

1. <https://youtu.be/aYrsPeE7NlQ>
2. https://youtu.be/913LV_0QDO0
3. <https://youtu.be/JEyzQtRPnjk>
4. <https://youtu.be/2LyY4t0Gfvs?si=Bq9dFIA4dHSQdSRg>
5. <https://youtu.be/UzaBAA3VJOY?si=MUQxwUgrykVZzkSt>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designers

1. Dr. R.Divya

CORE COURSE – IV (CC)
INTEGRAL CALCULUS
(2023-2024 Onwards)

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
23UMA2CC4	INTEGRAL CALCULUS	CORE COURSE – IV	4	4

Course Objective

- **Analyze** the properties of definite integral and Reduction formulae.
- **Explore** the order of Integration, Triple Integrals, Beta and Gamma functions.
- **Apply** Geometrical Applications of Integration of area under plane curve.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
	On the successful completion of the course, students will be able to	
CO1	Identify the integrals of algebraic, trigonometric and logarithmic functions and to find the reduction formulae.	K1, K2
CO2	Solve multiple integrals and to find the areas of curved surfaces and volumes of solids of revolution.	K3
CO3	Evaluate double and triple integrals and problems using change of order of integration.	K4
CO4	Explain beta and gamma functions and to use them in solving problems of integration	K5
CO5	Discover the applications of Integral Calculus.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	2	3	2
CO2	3	2	3	3	2	2	2	3	3	3
CO3	3	3	3	3	3	2	3	2	2	2
CO4	3	2	3	3	2	3	3	3	2	2
CO5	3	3	3	3	3	2	2	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Integration: Integration of rational algebraic functions – Rule(a), Rule(b), Rule(c) – Integration of irrational functions – Case(i), Case(ii) only.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Integration: Integration by parts – Reduction formulae – Bernoulli’s formula.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Multiple Integrals: Definition of the double integral – Evaluation of the double integral – Double integrals in polar co-ordinates – Triple integrals.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Improper integrals: Beta and Gamma functions: Definitions – Convergence to $\Gamma(n)$ – Recurrence formula of Gamma functions – Properties of Beta functions - Relation between Beta and Gamma functions.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Geometrical Applications of Integration: Areas under plane curves: Cartesian co-ordinates – Area of a closed curve – Areas in polar co-ordinates.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self -Study for Enrichment: (Not included for End Semester Examination) Integration of the form $\sqrt{ax^2 + bx + c}$ and $(px + q)\sqrt{ax^2 + bx + c}$ - Integration as summation - Applications of multiple integrals - Applications of Gamma functions to multiple integrals – Approximate Integration: Trapezoidal rule.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. Narayanan.S Manicavachagom Pillay.T.K. (2021). *Calculus Volume II*. Ananda Book Depot.

Chapters and Sections

UNIT-I	Chapter 1	Sections 7.1- 7.4, 8(Page No. 40-46)
	:	
UNIT-II	Chapter 1	Sections 12, 13, 14, 15.1.
	:	
UNIT-III	Chapter 5	Sections 2.1, 2.2, 3.1, 3.2, 4.
	:	
UNIT-IV	Chapter 7	Sections 2.1 - 2.3, 3, 4.
	:	
UNIT-V	Chapter 2	Sections 1.1 – 1.4
	:	

Reference Books

1. Shanti Narayan & Mittal, P. K (2008). *Integral Calculus*, S. Chand & Company Ltd.
2. Singh. U. P. Srivastava, R. J & Siddiqui, N. H. (2011). *A Text Book of Integral Calculus*, Wistom Press.
3. Singh. J. P. (2014) *Calculus*, Ane Books Pvt. Ltd.

Web References

1. <https://youtu.be/GIGJdvdrdhs?si=-zflb8uCpb7Aw0WT>
2. <https://youtu.be/ocgjff2AboA?si=8NMu-wdGBn9Yij9F>
3. <https://youtu.be/5SuPKa3Q9BM?si=taJPIYim2zdBJqZA>
4. <https://youtu.be/rCQZjpoVJ-o?si=VCw5630f1FEcLRh->
5. <https://youtu.be/xU1HBisdJJs?si=nChZzYPOKF8foCPT>
6. https://math.mit.edu/~nehcili/data/mat136_integration.pdf

7. [https://www.academia.edu/31132415/MA 210 lecture notes INTEGRATION TECHNIQUES pdf](https://www.academia.edu/31132415/MA_210_lecture_notes_INTEGRATION_TECHNIQUES_pdf)

Pedagogy

Chalk and Talk, Power point presentation, Group Discussion, seminar, Assignment and Quiz.

Course Designer

Dr. P. Sudha

CORE PRACTICAL –I (CP)

STATISTICS WITH EXCEL (P)

(2023-2024 Onwards)

Semester II	Internal Marks: 40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
23UMA2CC1P	STATISTICS WITH EXCEL (P)	CORE	2	2

Course Objective

- **Understands** the basic concepts in quantitative data analysis.
- **Apply** the technical knowledge to **interpret** and **solve** the problems.
- **Explore** the ideas of Excel in Statistics.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explore various statistical concepts in Excel.	K3
CO2	Solve the different types of statistical problems using Excel.	K3
CO3	Make use of formulas, including the use of built-in functions.	K3
CO4	Compute Statistical data's using Excel.	K3
CO5	Analyze the concepts of statistical methods and apply it to the real-life problems.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	1	2	3	2	2	2	3	2	2	2
CO2	1	2	3	2	2	2	3	2	2	2
CO3	1	2	3	2	2	2	3	2	2	2
CO4	1	2	3	2	2	2	3	2	2	2
CO5	1	2	3	2	2	2	3	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

LIST OF PROGRAMS:

- 1) Arithmetic Mean, Geometric Mean and Harmonic Mean.
- 2) Median and Mode.
- 3) Quartile Deviation and Mean Deviation.
- 4) Standard Deviation and Co-efficient of Variation.
- 5) Moments and Kurtosis.
- 6) Fitting of a Binomial Distribution.
- 7) Fitting of a poisson distribution.
- 8) Karl Pearson's Co-efficient of correlation.
- 9) Rank Correlation.
- 10) Fit the regression line.
- 11) Test the hypothesis for the difference between two sample means.
- 12) Test the hypothesis for single proportion.
- 13) Test the significance of hypothesis using 't' test.
- 14) Test the significance of hypothesis using 'F' test.
- 15) Test the significance of hypothesis using chi-square test.

Web References

1. <https://youtu.be/rRGJZp6GLsY>
2. <https://youtu.be/6dw3KNn0dYw>
3. <https://youtu.be/L9TiYC6tQmU>
4. <https://youtu.be/rAKu30EtVg8>
5. <https://youtu.be/GzUNF0PspYw>
6. <https://youtu.be/vqvBX0fe0S8>
7. <https://youtu.be/bcUW8kELOLw>
8. <https://youtu.be/sPgm9e8pDQM>
9. <https://youtu.be/7Y1g340tcbU>
10. https://youtu.be/L_a8Z0BVjyM
11. <https://youtu.be/0Bjf8LKnSOA>
12. https://youtu.be/BlS11D2VL_U

Pedagogy

Power point presentations, Live Demo, Hands on training.

Course Designer

Dr. C. Saranya

FIRST ALLIED COURSE – III (AC)
APPLIED STATISTICS
(2023-2024 Onwards)

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
23UMA2AC3	APPLIED STATISTICS	ALLIED	4	3

Course Objective

- **Define** the notion of measures of central tendency, measures of dispersion.
- **Explore** the fundamental concepts correlation and regression.
- **Apply** the idea of large sample tests and small sample tests in various fields.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define measures of central tendency, correlation, regression, measures of dispersion, large and small sample tests.	K1
CO2	Explain the basic concepts of measures of central tendency, measures of dispersion, correlation, regression, large and small sample tests.	K2
CO3	Apply the various concepts of correlation, regression, measures of central tendency & dispersion and sampling tests for solving the problems.	K3
CO4	Solve the problems using measures of central tendency and dispersion, correlation, regression, large and small sample tests.	K3
CO5	Examine the given data and interpret the results.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	2	3	3	2	3
CO3	3	3	3	3	3	2	3	2	3	3
CO4	3	3	3	3	3	3	3	2	2	3
CO5	3	3	3	3	3	3	2	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Measures of Central Tendency: Arithmetic Mean – Properties of Arithmetic Mean – Merits and Demerits of Arithmetic Mean – Weighted Mean – Median – Merits and Demerits of Median – Mode – Merits and Demerits of Mode – Geometric Mean – Merits and Demerits of Geometric Mean – Harmonic Mean – Merits and Demerits of Harmonic Mean – Selection of an Average – Partition Values.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Measures of Dispersion: Measures of Dispersion – Range – Quartile Deviation – Mean Deviation – Standard Deviation and Root Mean Square Deviation – Relation between Standard Deviation and Root Mean Square Deviation – Different Formulae for Calculating Variance – Theorem (Variance of the Combined Series) – Coefficient of Dispersion – Coefficient of Variation.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Correlation and Regression: Karl Pearson Coefficient of Correlation – Limits of Correlation Coefficient – Rank Correlation – Repeated Ranks – Regression – Lines of Regression – Regression Curves – Regression Coefficients – Properties of Regression Coefficients.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Sampling and large Sample Tests: Tests of Significance for Large Samples – Sampling of Attributes – Test for Single Proportion – Test of Significance for Difference of Proportions – Test of Significance for Single Mean – Test of Significance for Difference of means – Test of Significance for the Difference of Standard Deviations. (Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Exact Sampling Distribution: Chi-square Test as a Test for Population Variance – Chi-square Test of Goodness of Fit – Independence of Attributes – Test for Single Mean – F-test for Equality of Population Variance. (Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Graphical Location of Partition Values – Moments – Probable Error of Correlation Coefficient – Angle between two Lines of Regression – Standard	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	Error of sample Mean – Applications of Chi-square Distribution – Applications of t-distribution – Applications of F-distribution.			

Text Book

Gupta.S.C and Kapoor.V.K. (2003). *Elements of Mathematical Statistics (Third Edition)*. Sultan Chand & Sons Educational Publishers, New Delhi.

Chapters and Sections

UNIT-I	Chapter 2: Sections 2.5 – 2.11 (Omit 2.11.1)
UNIT-II	Chapter 3: Sections 3.3 – 3.8
UNIT-III	Chapter 10: Sections 10.3, 10.6 & 10.7 (10.7.1 – 10.7.4)
UNIT- IV	Chapter 12: Sections 12.8, 12.9, 12.13 – 12.15
UNIT- V	Chapter 13: Sections 13.5.1 – 13.5.3 Chapter 14: 14.2.6, 14.2.7, 14.3.2

Reference Books

1. Pillai.R.S.N & Bhagavathi (2008). *Statistics, Theory and Practice*. S.Chand & Sons.
2. Bhishma Rao.G.S.S. (2011). *Probability and Statistics*. Scitech Publications (India) Pvt. Ltd..
3. Veerarajan.T (2010). *Probability, Statistics and Random Processes*. Tata McGraw Hill Education Private Limited.

Web References

1. <https://tinyurl.com/yu57nmb5>
2. <https://youtu.be/pSm9mgi65l4>
3. <https://youtu.be/BiLIcCtXmm0>
4. <https://youtu.be/xTpHD5WLu0A>
5. <https://tinyurl.com/yb57hh5e>
6. <https://tinyurl.com/h3nbyj35>
7. <https://rb.gy/muaxp>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. S. Vidhya

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with 'A' Grade by NAAC

ISO 9001:2015 Certified

PG AND RESEARCH DEPARTMENT OF MATHEMATICS



B.Sc., MATHEMATICS AUTONOMOUS SYLLABUS (2022-2023 and ONWARDS)

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS

VISION

To strive for excellence in the mathematical sciences in addition to encourage people to undertake opportunities in transdisciplinary domains.

MISSION

- To enhance analytical and logical problem-solving capabilities.
- To provide excellent mathematical science knowledge for a suitable career and to groom students for national prominence.
- To teach students how to use data analytics.
- To prepare students for transdisciplinary research and applications.
- Value-based education and service-oriented training programmes are used to acquire life skills.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc Mathematics, B.Sc Physics,
B.Sc Chemistry PROGRAMME

After completing a B.Sc., programme, a learner will be able to

PO NO.	On completion of B.Sc Mathematics / B.Sc Physics / B.Sc Chemistry Programme, the students will be able to
PO1	DOMAIN KNOWLEDGE Analyse, design and develop solutions by applying from fundamental concepts of basic sciences and expertise in discipline.
PO2	PROBLEM SOLVING Ability to think abstractly, to evaluate and concentrates effectively on problem-solving, as well as knowledge of global challenges.
PO3	CREATIVE THINKING AND TEAM WORK Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO4	EMPLOYABILITY Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO5	LIFE LONG LEARNING Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc MATHEMATICS

PSO NO.	The Students of B.Sc Mathematics will be able to	POs Addressed
PSO1	Procure a precise understanding of the mathematical concepts.	PO1, PO3
PSO2	Excel by enhancing interpersonal skills, overcoming procedural challenges and intending career paths.	PO3, PO4
PSO3	Recognize, strengthen and analyse mathematical problems in order to acquire better conclusion.	PO4, PO5
PSO4	Manipulate numerical abilities across a variety of domains.	PO2, PO5
PSO5	Develop and desire to learn more about advanced mathematics and its applications.	PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG AND RESEARCH DEPARTMENT OF MATHEMATICS

B.Sc MATHEMATICS PROGRAMME STRUCTURE

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the candidates admitted from the Academic year 2022-2023 Onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total	
							Hrs.	Marks			
								Int	Ext		
I	I	Language Course-I (LC)	இக்கால இலக்கியம்	22ULT1	6	3	3	25	75	100	
			Hindi Literature & Grammar – I	22ULH1							
			History of Popular Tales, Literature and Sanskrit Story	22ULS1							
			Basic French – I	22ULF1							
	II	English Language Course – I (ELC)	Functional English for Effective Communication – I	22UE1	6	3	3	25	75	100	
	III	Core Course – I (CC)	Differential Calculus and Trigonometry	22UMA1CC1	5	4	3	25	75	100	
		Core Course – II (CC)	Integral Calculus	22UMA1CC2	4	4	3	25	75	100	
		First Allied Course – I (AC)	Mathematical Statistics I	22UMA1AC1	5	4	3	25	75	100	
		First Allied Course – II (AP)	Mathematical Statistics (P)	22UMA1AC2P	2	2	3	40	60	100	
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal-Universal Human Values	22UGVE	2	2	-	100	-	100	
	Total				30	22				700	
II	I	Language Course-II (LC)	இடைக்கால இலக்கியமும், புதினமும்	22ULT2	5	3	3	25	75	100	
			Hindi Literature & Grammar – II	22ULH2							
			Poetry, Textual Grammar and Alankara	22ULS2							
			Basic French – II	22ULF2							
	II	English Language Course – II (ELC)	Functional English for Effective Communication – II	22UE2	6	3	3	25	75	100	
	III	Core Course – III (CC)	Differential Equations and Laplace Transforms	22UMA2CC3	5	5	3	25	75	100	
		Core Course – IV (CC)	Vector Calculus and Fourier Series	22UMA2CC4	4	4	3	25	75	100	
		Core Practical –I (CP)	MATLAB Programming (P)	22UMA2CC1P	2	2	3	40	60	100	
		First Allied Course – III (AC)	Mathematical Statistics II	22UMA2AC3	4	3	3	25	75	100	
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100	
		Ability Enhancement Compulsory Course-III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100	
	Extra Credit Course			SWAYAM	As per UGC Recommendation						
	Total					30	23				800

III	I	Language Course-III (LC)	காப்பியமும், நாடகமும்	22ULT3	5	3	3	25	75	100
			Hindi Literature & Grammar – III	22ULH3						
			Prose, Textual Grammar and Vakyarachana	22ULS3						
			Intermediate French – I	22ULF3						
	II	English Language Course – II (ELC)	Learning Grammar Through Literature – I	22UE3	6	3	3	25	75	100
	III	Core Course – V (CC)	Analytical Geometry (3D)	22UMA3CC5	4	4	3	25	75	100
		Core Course – VI (CC)	Classical Algebra and Theory of Numbers	22UMA3CC6	5	5	3	25	75	100
		Second Allied Course – I (AC)	Python Programming	22UMA3AC4	5	4	3	25	75	100
		Second Allied Course–II (AP)	Python Programming (P)	22UMA3AC5P	3	2	3	40	60	100
	IV	Generic Elective Course- I (GEC)	Mathematics for Competitive Examinations – I	22UMA3GEC1	2	2	3	25	75	100
Basic Tamil-I			22ULC3BT1							
Special Tamil-I			22ULC3ST1							
	Extra Credit Course	SWAYAM	As per UGC Recommendation							
	Total			30	23				700	

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course-IV (LC)	பண்டைய இலக்கியமும், உரைநடையும்	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French - II	22ULF4						
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature - II	22UE4	6	3	3	25	75	100
	III	Core Course – VII (CC)	Sequences and Series	22UMA4CC7	5	5	3	25	75	100
		Core Course – VIII (CC)	Methods in Numerical Analysis	22UMA4CC8	5	5	3	25	75	100
		Second Allied Course– III (AC)	Internet of Things	22UMA4AC6	4	3	3	25	75	100
		Internship	Internship	22UMA4INT	-	2	-	-	-	100
	IV	Generic Elective Course- II (GEC)	Mathematics for Competitive Examinations – II	22UMA4GEC2	2	2	3	25	75	100
			Basic Tamil-II	22ULC4BT2						
			Special Tamil-II	22ULC4ST2						
		Skill Enhancement Course – I (SEC)	Statistical Tools and Techniques - R Programming (P)	22UMA4SEC1P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM	As per UGC Recommendation						
	Total				30	25				800

V	III	Core Course – IX (CC)	Abstract Algebra	22UMA5CC9	6	6	3	25	75	100
		Core Course – X (CC)	Real Analysis	22UMA5CC10	5	5	3	25	75	100
		Core Course – XI (CC)	Statics	22UMA5CC11	5	5	3	25	75	100
		Core Course XII (CC)	Discrete Mathematics	22UMA5CC12	5	5	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. Operations Research	22UMA5DSE1A	5	4	3	25	75	100
			B. Astronomy	22UMA5DSE1B						
	C. Artificial Intelligence		22UMA5DSE1C							
	IV	Ability Enhancement Compulsory Course -IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	LaTeX (P)	22UMA5SEC2P	2	2	3	40	60	100
			Extra Credit Course	SWAYAM	As per UGC Recommendation					
Total					30	29				700
VI	III	Core Course – XIII (CC)	Linear Algebra	22UMA6CC13	5	5	3	25	75	100
		Core Course – XIV(CC)	Complex Analysis	22UMA6CC14	5	5	3	25	75	100
		Core Course –XV (CC)	Dynamics	22UMA6CC15	4	4	3	25	75	100
		Core Course –XVI (CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Discipline Specific Elective – II(DSE)	A. Graph Theory	22UMA6DSE2A	5	4	3	25	75	100
			B. Number Theory	22UMA6DSE2B						
			C. Fundamentals of Big Data Analytics	22UMA6DSE2C						
		Project	Project Work	22UMA6PW	5	4	-	-	100	100
	V	Gender Studies	Gender Studies	22UGGS	1	1	-	-	-	100
		Extension activity		22UGEA	0	1	0	-	-	-
Total					30	28				700
Grand Total					180	150				4400

Note:

Part – I-Language – Tamil/Hindi/French/Sanskrit

Part – II- English

List of Allied Courses:

Allied Course I- Mathematical Statistics

Allied Course II- Computer Science

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory& Practical)	16+1	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV- Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
		44		150

The Internal and External marks for Theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

FOR THEORY:

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks].

The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks].

FOR PRACTICAL:

The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks].

The passing minimum for University Examinations shall be 40% out of 60 marks [i.e. 24 marks].

(2022-2023 ONWARDS)

IV SEMESTER

CORE COURSE VII – (CC)
SEQUENCES AND SERIES
(2022-2023 Onwards)

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UMA4CC7	SEQUENCES AND SERIES	CORE	5	5

Course Objective

- To lay a good foundation for classical analysis.
- To study the behavior of sequences and series.
- To acquire the knowledge of solving problems in Binomial, Logarithm & Exponential Series.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the Successful completion of the course, students will be able to	
CO1	Explain the concepts of convergent sequences, divergent sequences and series.	K2
CO2	Apply the ideas of sequences in Algebra of limits and Compute the behavior of monotonic functions.	K3
CO3	Apply the theory of Cauchy's condensation test and Cauchy's root test on series.	K3
CO4	Solve the problems based on binomial, logarithmic and exponential series.	K3
CO5	Examine infinite series using D' Alembert's ratio test.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	3	2	3	2	3	3	3	2	2
CO3	3	3	2	3	2	3	3	3	2	2
CO4	3	3	3	3	3	3	2	3	3	3
CO5	3	3	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction – Sequences – Bounded Sequences – Monotonic Sequences – Convergent Sequences – Divergent Sequences and Oscillating Sequences – The Algebra of Limits.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Behavior of Monotonic sequences – Some theorems on limits –Subsequences -Limit points.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Infinite Series – Definition of Convergence, Divergence & Oscillate – Convergence of Geometric series – Some general theorems concerning infinite series – Series of positive terms – Comparison test- convergence of $\sum \frac{1}{n^k}$ – D’Alembert’s Ratio test.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Cauchy’s Condensation test – Cauchy’s Root test and their simple problems – Absolute Convergence Series– Conditional Convergence Series – Alternative Series.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Binomial theorem for a rational index – Some important particular case of the Binomial expansion – Sign of terms in binomial expansion – Numerically greatest term – Method of splitting functions into partial fractions – Application of the Binomial theorem to the summation of series – Exponential limit – The exponential theorem – Summation – Logarithmic series – Modification of the logarithmic series – Summation of series – Series which can be summed up by the	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	logarithmic series.			
VI	Self Study for Enrichment: (Not included for End Semester Examination) Cauchy sequence - Raabe's test - Uniform Convergence- Approximate values - Euler's constant - The application of the exponential and logarithmic series to limits and approximations.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Dr.S.Arumugam & Mr.A.Thangapandi Isaac(2015), Sequences and Series ,New Gamma Publishing House.
2. T.K.Manicavachagam Pillai, T.Natarajan & K.S.Ganapathy (2010), Algebra, Volume I , S.Viswanathan Pvt Limited.

Chapters and Sections

- UNIT-I Chapter III: Sections 3.0-3.6[1]
- UNIT-II Chapter III: Sections 3.7-3.10[1]
- UNIT-III Chapter II: Sections 8-14, 16 [2]
- UNIT- IV Chapter II: Sections 15, 17, 21-24[2]
- UNIT- V Chapter III: Sections 5-10 [2]
- Chapter IV: Sections 1-3, 5-7, 9[2]

Reference Books

1. M.K. Singal and Asha Rani Singal (2018). A First course in Real Analysis.R.chand & Co.
2. Shanti Narayan, P.K.Mittal (2002). A Course of Mathematical Analysis . S.Chand & Company Ltd.
3. Dr.P.R. Vittal (2014). Allied Mathematics. Margham Publications.

Web Links

1. https://youtu.be/XdkoTb8PEG0?si=u_ZtB1anBe7bi0vt
2. <https://youtu.be/BZ-LQpz5EBc?si=9H5Ydbq9amtAxUX4>
3. https://youtu.be/zg9N2gAf6a4?si=_07ubR0LI3GBhMU

4. <https://youtu.be/Fjrb8f-assM?si=Hsn2y6rGxAS4AU-V>
5. <https://youtu.be/jmZIEyabJIU?si=PQB-8QllG1OGxEvv>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

CourseDesigners

1. Dr. R.Divya

CORE COURSE VIII– (CC)
METHODS IN NUMERICAL ANALYSIS
(2022-2023 Onwards)

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UMA4CC8	METHODS IN NUMERICAL ANALYSIS	CORE COURSE	5	5

Course Objectives:

- To introduce the basic concepts of solving algebraic and transcendental equations.
- To introduce the numerical techniques of interpolation in various intervals.
- To understand the knowledge of numerical techniques of differentiation and integration.

Course Outcome

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Apply numerical methods to solve Algebraic, Transcendental equations.	K1, K2
CO2	Classify and solve the numerical techniques of interpolation in various intervals.	K2, K4
CO3	Solve numerical integration and differentiation problems.	K3
CO4	Determine the system of algebraic equations by various methods.	K5
CO5	Compute the numerical solution of ordinary differential equation Using different methods.	K3

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	3
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Introduction – Iteration Method – Bisection Method – Regula Falsi Method – Newton - Raphson Method – Horner’s Method (Problems only)	15	CO1, CO2, CO3, CO4, CO5	K1 K2 K3 K4
II	SIMULTANEOUS EQUATIONS: Introduction–Simultaneous Equations – Back Substitution – Gauss Elimination Method – Gauss-Jordan Elimination Method – Calculation of inverse of a Matrix – Crout’s Method – Iterative Methods – Gauss Jacobi Iteration Method – Gauss-Seidel Iteration Method (Problems only).	15	CO1, CO2, CO3, CO4, CO5	K1 K2 K3 K4
III	INTERPOLATION: Introduction – Newton’s interpolation formula – Lagrange’s interpolation formula (Problems only)	15	CO1, CO2, CO3, CO4, CO5	K1 K2 K3 K4
IV	NUMERICAL DIFFERENTIATION AND INTEGRATION: Introduction – Derivatives using Newton’s forward difference formula – Derivatives using Newton’s backward difference formula - Numerical Integration: Newton-Cotes	15	CO1, CO2, CO3, CO4, CO5	K1 K2 K3 K4

	quadrature formulae - Trapezoidal Rule – Simpson's one third Rule – Simpson's three eight Rule – Weddle's Rule – Romberg's Method (Problems only)			
V	NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: Introduction – Taylor's Series Method – Euler's Method: Modified Euler's Method, Runge - Kutta Methods: Second order and Fourth order R.K Methods – Predictor Corrector Methods – Milne's Method (Problems only)	15	CO1, CO2, CO3, CO4, CO5	K1 K2 K3 K4
VI	Self Study for Enrichment: (Not included for End Semester Examination) Relaxation Method – Newton Raphson Method for simultaneous equations – Newton's divided differences formula – Gaussian quadrature formula – Adams - Bashforth Method	-	CO1, CO2, CO3, CO4, CO5	K1 K2 K3 K4

Text Books:

S. Arumugam, A. Thangapandi Isaac and A. Somasundaram, (2017), *Numerical Methods*, Second Edition ,Scitech Publications (India) Pvt. Ltd.

Chapters and Sections:

UNIT I Chapter 3: Sections 3.0, 3.2 – 3.6

UNIT II Chapter 4: Sections 4.0-4.8

UNIT III Chapter 7: Sections 7.0, 7.1, 7.3

UNIT IV Chapter 8: Sections 8.0 - 8.2, 8.5

UNIT V Chapter 10: Sections 10.0, 10.1,10.3-10.6

Reference Books:

1. M.K. Jain, S.R.K. Iyengar and R.K. Jain (1999), *Numerical Methods for Scientific and Engineering Computations*, New Age International Private Limited.
2. C.E. Froberg (1979), *Introduction to Numerical Analysis*, II Edition , Addison Wesley.
3. Dr. P. Kandasamy, Dr. K. Thilagavathy and Dr. K. Gunavathi, (2013) *Numerical Methods*, S. Chand & Company Pvt Ltd.

Web links:

1. <https://youtu.be/39pu-z3KpAQ?list=PLbzVLFZiGEdQnmR2M2jDmi0nVHUF3WPYg>
2. <https://youtu.be/ukNbG7muKho>
3. <https://youtu.be/Ym1EUjTWMnE>
4. https://youtu.be/o7uwKpZNa_k
5. <https://youtu.be/82IDoaiYU0c>
6. <https://youtu.be/oTN7hGoSPMw>
7. <https://youtu.be/-Lf0VZzKRw0>

Pedagogy:

Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

Course Designer:

Dr.R.Radha

GENERIC ELECTIVE COURSE – II (GEC)
(For BCA, B.Sc Computer Science with Cognitive, B.Sc IT)
MATHEMATICS FOR COMPETITIVE EXAMINATIONS - II
(2022-2023 Onwards)

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UMA4GEC2	MATHEMATICS FOR COMPETITIVE EXAMINATIONS-II	GENERIC ELECTIVE COURSE – II	2	2

Course Objective

- **Explain** many short tricks to solve the mathematical problems easily.
- **Apply** the knowledge to **interpret** and **solve** the problems.
- **Explore** the ideas and to solve the Mathematical problems.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
CO1	On the successful completion of the course, students will be able to Explain the knowledge of the various techniques of Quantitative Aptitude and Reasoning.	K1, K2
CO2	Apply the concepts in solving mathematical problems to succeed in various Competitive examinations.	K3
CO3	Examine various types of Problems using Arithmetic and Reasoning test.	K3
CO4	Apply the different concepts of Arithmetic and Reasoning test to solve the problems.	K3
CO5	Analyze real-life problems and finding solutions.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	3	3	3
CO2	3	2	2	2	2	2	3	3	3	3
CO3	3	2	2	2	2	3	3	2	2	3
CO4	3	2	2	2	2	3	3	2	2	2
CO5	3	2	2	2	2	3	3	3	3	2

“1” – Slight (Low) Correlation → “2” – Moderate (Medium) Correlation →

“3” – Substantial (High) Correlation → “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Decimal Fractions – Simplification.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Square Roots - Cube Roots – Profit & Loss.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Ratio & Proportion - Problems on Trains - Boats and Streams.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Simple Interest - Compound Interest.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Percentage - Permutations & Combinations.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self -Study for Enrichment: (Not included for End Semester Examination) Numbers- Approximation- Average - Time and Work - Odd Man Out & Series	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

Aggarwal. R.S . (2015). *Quantitative Aptitude For Competitive Examinations (Fully Solved)*.
S.Chand & Company Pvt.Ltd.

Chapters and Sections

UNIT-I Chapter 3 , 4 : Pg.No 46 – 116
UNIT-II Chapter 5, 11 : Pg.No 117 – 138 , 251-293

UNIT-III	Chapter 12,18,19	: Pg.No 294-310 , 405 - 434
UNIT- IV	Chapter 21,22	: Pg.No 445 – 486
UNIT- V	Chapter 10,30	: Pg.No 208 – 250 , 613 – 620

Reference Books

1. Edgar Thorpe. (2000). *Test of Reasoning for Competitive Examinations*. Tata McGraw-Hill Publishing Company Limited, New Delhi, 2nd Edition.
2. Sinha. T.K. (2002). *80+ Practice Sets of Quantitative Aptitude for Bank PO Exams*. Arihant Publication (India) limited.
3. Abhijit Guha.(2014). *Quantitative Aptitude for Competitive Examinations*. McGraw-Hill Publishing Company Limited, New Delhi, 5 th Edition.

Web References

1. <https://www.youtube.com/watch?v=wR0aaQMfxwI>
2. <https://www.youtube.com/watch?v=Sjpkp8-0t1s>
3. <https://byjus.com/govt-exams/train-problems/>
4. <https://www.sscadda.com/compound-interest-formulas-tricks-and-questions/>
5. <https://www.youtube.com/watch?v=6B-dvOMTeV8>
6. <https://www.youtube.com/watch?v=VSoJwLYdCWM>

Chalk and Talk, Power point presentation, Group Discussion, Seminar, Assignment and Quiz.

Course Designer

1. Dr.L.Mahalakshmi

SKILL ENHANCEMENT COURSE – I (SEC)
STATISTICAL TOOLS AND TECHNIQUES - R PROGRAMMING (P)
(2022 - 2023 Onwards)

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UMA4SEC1P	STATISTICAL TOOLS AND TECHNIQUES - R PROGRAMMING (P)	SKILL ENHANCEMENT COURSE – I (SEC)	2	2

Course Objectives

- **Understand** how to use the R documentation.
- **Describe** key terminologies, concepts and techniques employed in Statistical Analysis.
- **Apply** various concepts to write programs and statistical analysis through R language.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Calculate simple arithmetic and statistical operations in R	K1
CO2	Interpret the R programming language and its programming environment	K2
CO3	Apply the Statistical Programming Software	K3
CO4	Manipulate data within R and to create simple graphs and charts	K3
CO5	Compute R programming from a statistical Perspective	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	3	2	2	2
CO2	3	3	3	2	2	2	3	2	2	3
CO3	2	2	2	2	2	2	2	2	2	2
CO4	2	3	2	3	2	3	2	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

LIST OF PROGRAMS

1. Creating and displaying data.
2. Matrix Manipulations.
3. Creating and manipulating a List and an Array.
4. Bar diagrams, Bar plots and subdivided Bar plots.
5. Pie diagram, 3D Pie diagram and Histogram.
6. Reading a CSV file and Calculating the Measures of Central Tendency.
7. String Manipulations.
8. Vector Operations.
9. Control Statements
10. User defined functions

Web References

1. <https://www.w3resource.com/r-programming-exercises/>
2. <https://www.r-project.org/about.html>
3. <https://www.tutorialspoint.com/r/index.htm>
4. <https://modernstatisticswithr.com/introduction.html#welcome-to-r>
5. <https://www.w3schools.com/r/default.asp>

Pedagogy

Power point presentations and Illustrations.

Course Designer

Ms. R. Soundaria

(2022-2023 ONWARDS)

V SEMESTER

CORE COURSE - IX(CC)
ABSTRACT ALGEBRA
(2022-2023 and Onwards)

Semester V	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UMA5CC9	ABSTRACT ALGEBRA	CORE	6	6

Course Objectives

- **Understand** the concepts and properties of algebra and their application.
- **Provide** the principles and practices of algebra.
- **Construct** a legitimate proof involves different skills and expertise problem solving.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand the basic concept of Group and Ring Theory with examples.	K2
CO2	Illustrate the variety of problem-solving methods used in the relevant field.	K2
CO3	Apply various algebraic terminology.	K3
CO4	Explain the main results of Group and Ring Theory	K3
CO5	Analyse clear and accurate points using the concept of Groups and Rings.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	2	3	2	2	3
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	2	3	3	3	2	3	3	3
CO4	3	2	3	3	2	2	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Group Theory: Definition of a Group- Some Examples of Groups- Some Preliminary Lemmas-Subgroups.	18	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
II	Group Theory: A Counting Principle – Normal Subgroups and Quotient Groups - Homomorphisms.	18	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
III	Group Theory: Automorphisms - Cayley's Theorem - Permutation Groups.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Ring Theory: Definition and Examples of Rings – Some Special Classes of Rings – Homomorphisms – Ideals and Quotient Rings - More Ideals and Quotient Rings.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Ring Theory: The Field of Quotient of an Integral Domain - Euclidean Rings – A Particular Euclidean Ring – Polynomial Rings – Polynomials over the Rational Field.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment: (Not included for End Semester Examinations) Set theory – Mappings – Another Counting Principle – Polynomial Rings Over Commutative Rings.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

Herstein .I.N (Reprint 2016), *Topics in Algebra* (2nd Edition), Wiley, New Delhi.

Chapters and Sections

UNIT-I	Chapter 2:	Sections 2.1-2.4
UNIT-II	Chapter 2:	Sections 2.5-2.7
UNIT-III	Chapter 2:	Sections 2.8-2.10
UNIT- IV	Chapter 3:	Sections 3.1-3.5
UNIT- V	Chapter 3:	Sections 3.6 – 3.10

Reference Books

1. Arumugam. S & Thangapandi Isaac. A (May 2017), *Modern Algebra*, Scitech Publications India (Pvt) Ltd, Chennai.
2. Bhat V K (2014), *Modern Algebra and Applications*, Narosa Publishing House, New Delhi.
3. Santiago M L (2001), *Modern Algebra*, Tata Mcgraw - Hill Publishing Company Limited, New Delhi.

Web References

1. <https://youtu.be/CJpZJLYKk0I>
2. <https://youtu.be/mcX0sMnYyMU>
3. <https://youtu.be/lrQMV4zGF44>
4. <https://youtu.be/7LtpPI46O0Q>
5. <https://youtu.be/K1iuXqHFWRw>
6. <https://math.berkeley.edu/~apaulin/AbstractAlgebra.pdf>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz and Assignment.

Course Designer

Ms. V. ManiMozhi

CORE COURSE - X(CC)
REAL ANALYSIS
(2022-2023 and Onwards)

Semester - V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UMA5CC10	REAL ANALYSIS	CORE COURSE	5	5

Course Objectives

- **Enable** the students to understand the basic concepts of Analysis.
- **Impart** knowledge in concepts of solving various problems regarding field axioms.
- **Construct** a proof that involves different problem solving ideas and expertise in them.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the basic concepts of Sequences and Series.	K1
CO2	Interpret the fundamental ideas in limits and functions.	K2
CO3	Relate the concepts of Continuity with limits.	K3
CO4	Determine the implementation of open sets and closed sets.	K4
CO5	Deduce mathematical notions in Metric Spaces.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	2	3	3
CO5	3	3	3	2	3	3	3	3	3	3

“1” – Slight (Low) Correlation –

“2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	SETS AND FUNCTIONS: Operations on sets- Functions – Real-valued functions –Equivalence, Countability – Real numbers - Least upper bounds.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	LIMITS AND METRIC SPACES: Limit of a function on the real line – Metric spaces – Limits in metric spaces.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	CONTINUOUS FUNCTIONS ON METRIC SPACES: Functions continuous at a point on the real line – Reformulation – Functions continuous on a metric space – Open sets – Closed sets	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	CONTINUOUS FUNCTIONS ON METRIC SPACES: Discontinuous functions on $\mathbb{R}^1$ CONNECTEDNESS, COMPLETENESS AND COMPACTNESS: More about open sets – Connected sets – Bounded sets and totally bounded sets – Complete metric spaces.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	CONNECTEDNESS, COMPLETENESS AND COMPACTNESS: Compact metric spaces – Continuous functions on compact metric spaces – Continuity of the inverse function – Uniform continuity.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Sets and elements – Definition of a sequence and subsequence -Limit of a sequence- Convergent sequences-Divergent sequences-Monotone sequences.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Richard R. Goldberg (2019), *Methods of Real Analysis*, Oxford & IBH Publishing Co. Pvt.Ltd, New Delhi.

Chapters and Sections

- UNIT-I Chapter 1: Sections 1.2 - 1.7
UNIT-II Chapter 4: Sections 4.1 - 4.3
UNIT-III Chapter 5: Sections 5.1-5.5
UNIT-IV Chapter 5: Sections 5.6
Chapter 6: Sections 6.1 – 6.4
UNIT-V Chapter 6: Sections 6.5 – 6.8

Reference Books

1. Tom M. Apostol, (2002), *Mathematical Analysis(second edition)*, Addison-Wesley Publishing Company.
2. Robert G. Bartle, Donald R. Sherbert(2007), *Introduction to Real Analysis*, John Wiley & Sons. Private Ltd.,
3. Singal M. K., Asha Rani Singal(2018), *A First Course in Real Analysis*, R. Chand & Co.

Web References

1. <https://youtu.be/XjiT88Czx5c?t=15>
2. <https://youtu.be/1diSwLMJpvs?t=626>
3. <https://youtu.be/YEG18ISnThE?t=4>
4. <https://youtu.be/4TzGkHFnn7g?t=3>
5. <https://youtu.be/y5tni8My-VY?t=4>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. S. Saridha

CORE COURSE- XII (CC)
DISCRETE MATHEMATICS
(2022-2023 onwards)

Semester V	Internal Marks: 25		External Marks: 75	
COURSECODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UMA5CC12	DISCRETE MATHEMATICS	CORE COURSE	5	5

Course Objectives

- **Understand** the basics of discrete mathematics.
- **Apply** the method of logical reasoning to solve a variety of problems.
- **Introduce** the concepts of Lattices and Boolean Algebras.

Prerequisite

Familiarity in concepts of Discrete Mathematics.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand concepts on statements and truth tables, mathematical logic, mathematical reasoning and to study about the validity of the arguments and also prove mathematical theorems .	K2
CO2	Determine properties of binary relations; identify equivalence and partial order relations, sketch relations and familiarize with algebraic structures.	K2
CO3	Convert logical statements from informal language to propositional (and quantified) logic expressions and apply formal methods of symbolic propositional logic, such as calculating validity of formulae and computing normal forms.	K3
CO4	Use truth tables and laws of identity, distributive, commutative, and domination and rules of inference to construct proofs in propositional logic.	K3
CO5	Compute sum of products, product of sum expansions, the inference theory of predicate calculus and its characteristics. Analyze and apply the theory of lattices and Boolean expressions.	K3

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	2	3	3	3	3	3	3
CO2	3	3	2	1	3	3	2	3	3	3
CO3	3	3	2	2	3	3	3	3	3	3
CO4	3	3	2	2	3	3	3	3	2	3
CO5	3	3	2	2	3	2	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Statements and Notation – Connectives: Negation – Conjunction – Disjunction – Statement formulas and Truth Tables – Conditional and Biconditional – Well-Formed Formulas– Tautologies – Equivalence of formulas – Duality Law –Tautological Implications – Formulas with Distinct Truth Tables – Functionally complete sets of connectives.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Normal Forms: Disjunctive Normal Forms – Conjunctive Normal Forms – Principal Disjunctive Normal Forms – Principal Conjunctive Normal Forms – Ordering and Uniqueness of Normal Forms.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	The Predicate Calculus: Predicates – The Statement Function, Variables and Quantifiers– Predicate Formulas – Free and Bound Variables – The Universe of Discourse – Inference Theory of the Predicate Calculus – Valid Formulas and Equivalences – Some Valid Formulas over Finite Universe – Special Valid Formulas Involving Quantifiers – Theory of Inference for the Predicate Calculus –Binary and n-ary Operations – Characteristic Function of a Set.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

IV	Lattices as Partially Ordered Sets: Definition and Examples – Some Properties of Lattices – Lattices as Algebraic Systems – Sub Lattices, Direct Product and Homomorphism – Some Special Lattices.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Boolean Algebra: Definition and Examples – Sub Algebra, Direct Product and Homomorphism – Boolean Functions: Boolean Forms and Free Boolean Algebras – Values of Boolean Expressions and Boolean Functions	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment: (Not included for End Semester Examinations) Formulas Involving More Than One Quantifier – Hashing Functions – Representation and Minimization of Boolean Functions: Representation of Boolean Functions – Minimization of Boolean Functions.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

2. J.P. Trembley & R. Manohar (2011), *Discrete Mathematical Structures With Applications to Computer Science*, Tata McGraw Hill.

Chapters and Sections

UNIT-I	Chapter 1:	Sections 1.1
	Chapter 1:	Sections 1.2.1 – 1.2.4, 1.2.6 – 1.2.13
UNIT-II	Chapter 1:	Sections 1.3.1-1.3.5
UNIT-III	Chapter 1:	Sections 1.5.1 – 1.5.5, 1.6.1-1.6.5
	Chapter 2:	Sections 2.4.4-2.4.5
UNIT-IV	Chapter 4:	Sections 4.1.1 – 4.1.5
UNIT-V	Chapter 4:	Sections 4.2.1-4.2.2, 4.3.1-4.3.2

Reference Books

4. Chandrasekhara Rao K (2012), *Discrete Mathematics*, Narosa Publishing House, India.
5. Thomas Koshy (2012), *Discrete Mathematics with applications*, Elsevier, a division of Reed Elsevier India Private Limited.
6. T Veerarajan (2007), *Discrete Mathematics with Graph Theory and Combinatorics*, The McGraw-Hill Companies, New Delhi.

Web References

1. <https://youtu.be/i3m0hV157Ro>
2. <https://youtu.be/5cyocztOtg4>
3. <https://youtu.be/w9DyAVrU8j0>
4. https://youtu.be/qPtGlrB_sXg
5. <https://youtu.be/MH2uTVgG1bo>
6. <https://home.iitk.ac.in/~aralal/book/mth202.pdf>
7. <https://www.cs.yale.edu/homes/aspnes/classes/202/notes.pdf>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. G.Janaki

DISCIPLINE SPECIFIC ELECTIVE – I (DSE)
OPERATIONS RESEARCH
(2022-2023 Onwards)

Semester - V	Internals 25			Externals 75
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22UMA5DSE1A	OPERATIONS RESEARCH	DISCIPLINE SPECIFIC ELECTIVE – I (DSE)	5	4

Course Objectives

- **Impart** knowledge in concepts and tools of Operations Research.
- **Equip** mathematical methods formatted for major concepts.
- **Apply** these techniques constructively to make effective business making.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
	On the successful completion of the course, the students will be able to	
CO1	Understand the objectives, phases, models, used in operation research.	K1,K2
CO2	Construct mathematical model of a particular problem	K3
CO3	Develop analytical problem solving and decision-making thinking.	K3
CO4	Discover the practical skills in problem solving.	K4
CO5	Analyze solutions to real life problems using Operations Research.	K4

Mapping with Programme Outcomes

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation –

“2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation –

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Operations Research - An Overview: Introduction – Origin and Development of O.R- Nature and Features of O.R-Scientific Method in O.R- Modelling in O.R- Advantages and Limitations of Models –General Solution Methods for O.R models- Methodology of O.R- O.R and Decision Making –Applications of O.R - Opportunities and shortcomings of O.R. Linear Programming Problem: Introduction – Linear Programming Problem - Mathematical formulation of the problem– Illustrations on Mathematical formulation of Linear Programming Problems. Linear Programming Problem-Graphical solution and Extension Introduction – Graphical Solution Method – Some Exceptional Cases – General Linear Programming Problem - Standard Forms of Linear Programming Problem.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Linear Programming Problem-Simplex Method Introduction – Fundamental Properties of Solutions – The Computational Procedure – Use of Artificial Variables. Duality in Linear Programming Introduction-General Primal Dual Pair – Formulating a Dual Problem –Dual simplex method.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Transportation Problem: The Transportation table-Solution of a Transportation Problem – Finding an initial basic feasible solution –Test for optimality-Economic Interpretation of u_j's and v_j's- Degeneracy in Transportation Problem-Transportation Algorithm (MODI Method). Assignment problem: Introduction – Mathematical formulation of the problem - Solution Methods of Assignment Problem – Special cases in Assignment	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	Chapter 3:	Sections 3.1- 3.5
UNIT-II	Chapter 4:	Sections 4.1- 4.4
	Chapter 5:	Sections 5.1-5.3, 5.9
UNIT-III	Chapter 10:	Sections 10.5, 10.8-10.13
	Chapter 11:	Sections 11.1-11.5, 11.7
UNIT-IV	Chapter 12:	Sections 12.1-12.5
	Chapter 17:	Sections 17.1-17.6
UNIT-V	Chapter 25:	Sections 25.1-25.10

Reference Books

7. Hamdy A. Taha (2002), Operations Research, Prentice Hall of India.
8. Richard Bronson (2001), Theory and Problems of Operations Research, Tata McGraw Hill Publishing Company.
9. V Sundaresan, K S Ganapathy Subramanian, K Ganesan (2015), Resource Management Techniques, AR Publications.

Web References

1. https://youtu.be/O6QO3J_85as
2. <https://youtu.be/GhplZYVCPkU>
3. <https://youtu.be/npJNx0jXbNI>
4. https://youtu.be/FdaXNmUxz_I
5. <https://youtu.be/vUMGvpsb8dc>
6. https://youtu.be/hwGFu_M_yHY

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz and Seminar.

Course Designer

Dr. P.SARANYA

DISCIPLINE SPECIFIC ELECTIVE-I (DSE)
ASTRONOMY
(2022-2023 Onwards)

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UMA5DSE1B	ASTRONOMY	DISCIPLINE SPECIFIC ELECTIVE-I (DSE)	5	4

Course Objective

- **Explain** the basic concepts of spherical trigonometry in the field of astronomy.
- **Emphasize** the movements of the celestial objects.
- **Explore** the concept of terrestrial latitudes and longitudes.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
CO1	Identify spherical triangle, latitudes, equation of time, heliocentric parallax and age of moon.	K1
CO2	Explain the concepts of celestial sphere, diurnal motion, twilight, refraction, aberration and eclipses.	K2
CO3	Classify triangles, circumpolar stars, refraction, parallax and eclipses.	K3
CO4	Determine napier's rules, reduction of latitude, laws of refraction, effects of geocentric parallax and elongation.	K4
CO5	Ascertain diurnal motion, dip of horizon, Kepler's laws, aberration and eclipses.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	3	2	2	3
CO2	3	2	2	2	2	3	3	2	2	3
CO3	3	2	2	2	2	3	3	3	3	3
CO4	3	2	2	2	2	3	3	3	2	3
CO5	3	2	2	2	2	3	3	3	2	3

“1” – Slight (Low) Correlation → “2” – Moderate (Medium) Correlation →

“3” – Substantial (High) Correlation → “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Spherical Trigonometry – Celestial Sphere, Diurnal Motion.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Zones of Earth- Terrestrial Latitudes and Longitudes – Radius of Earth – Rotation of Earth – Dip of Horizon – Twilight.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Refraction – Kepler's Laws - Equation of Time – Seasons.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Geocentric Parallax – Heliocentric Parallax – Aberration.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	The Moon – Eclipses.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self -Study for Enrichment: (Not included for End Semester Examination) Formulae in plane Trigonometry – Another method to determine the radius of earth – Arguments in favour of earth's rotation – Influence of temperature and pressure of atmosphere on Refraction – Aberration and stellar parallax compared –Earth shine – The Tides – Occultations. .	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. Kumaravelu. S, Susheela Kumaravelu. (2011). *Astronomy* (Revised and enlarged edition). S.Kumaravelu Publications, Nagercoil.

Chapters and Sections

UNIT-I	Chapter 1: Art 1- 36,38 Chapter 2 : Art 39- 86
UNIT-II	Chapter 3: Art 87 – 102, 105-116
UNIT-III	Chapter 4: Art 117- 133 Chapter 6: Art 146 – 165 Chapter 7: Art 166 - 174
UNIT- IV	Chapter 5: Art 135 - 145 Chapter 8: Art 190 - 194 Chapter 9: Art 195 – 201,203
UNIT- V	Chapter 12: Art 229 – 253 Chapter 13: Art 256 - 283

Reference Books

1. Dennis Morris (2015). *The Special Theory of Relativity*. Scientific International Pvt Ltd, New Delhi.
2. Abhyankar. K. D. (2012). *Astrophysics of the Solar System* (Reprinted 2009,2012). Universities Press. India.
3. Padmanabhan. T. (2010). *Theoretical Astrophysics Volume II: Stars and Stellar Systems* (First South Asian edition). Cambridge University Press, Tokyo.

Web References

1. <https://youtu.be/F2NqTIEj98Q?si=ekaNnpb4up1zPvPb>
2. <https://youtu.be/iPp2KZWBR5k?si=japVt5BnqfSnabqo>
3. <https://youtu.be/OBHFjvjsKyA?si=q4ao5liitob998J0>
4. <https://youtu.be/ETzUpoqZIHY?si=vTiFgcY-8ipYh4OC>
5. <https://youtu.be/GnZ3dogED7w?si=jZPZYuJRiNbO8GXW>
6. <file:///C:/Users/Administrator/Downloads/planetary.pdf>

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment.

Course Designers

1. Dr.S.Premalatha

DISCIPLINE SPECIFIC ELECTIVE – I (DSE)**ARTIFICIAL INTELLIGENCE****(2022-2023 Onwards)**

Semester V	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UMA5DSE1C	ARTIFICIAL INTELLIGENCE	DISCIPLINE SPECIFIC ELECTIVE – I (DSE)	5	4

Course Objective

- **Learn** the methods of solving problems using Artificial Intelligence.
- **Apply** AI techniques to real-world problems to develop intelligent systems.
- **Develop** an understanding of modern concepts in AI and where they can be used.

Course Outcomes**Course Outcome and Cognitive Level Mapping**

CO Number	CO Statement	Knowledge Level
	On the successful completion of the course, students will be able to	
CO1	Identify problems where artificial intelligence techniques are applicable	K1, K2
CO2	Solve basic AI based problems.	K3
CO3	Explain the concept of Knowledge Representation	K3
CO4	Examine the issues involved in knowledge bases, reasoning systems and planning	K4
CO5	Summarize appropriate AI methods to solve a given problem. Familiar with Artificial Intelligence, its foundation and principles	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	2	3	3	2	3	3	2	3	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	3	2	3
CO5	3	3	3	3	3	2	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	What is Artificial Intelligence?: The AI Problems – The Underlying Assumption – What is an AI Technique? – The Level of the Model – Criteria for Success. Problems, Problems Spaces, and Search: Defining the Problem as a State Space Search – Production Systems – Problem Characteristics – Production System Characteristics – Issues in the Design of Search Programs – Additional Problems.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Heuristic Search Techniques: Generate-and-Test – Hill Climbing – Best-first Search – Problem Reduction – Constraint Satisfaction – Means-ends Analysis.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Knowledge Representation Issues: Representations and Mappings – Approaches to Knowledge Representation. Using Predicate Logic: Representing Simple Facts in Logic – Representing Instance and ISA Relationships – Computable Functions and Predicates.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

IV	Representing Knowledge Using Rules: Procedural Versus Declarative Knowledge – Logic Programming – Forward Versus Backward Reasoning – Matching – Control Knowledge. Symbolic Reasoning Under Uncertainty: Introduction to Nonmonotonic Reasoning - Logics for Nonmonotonic Reasoning – Implementation Issues – Augmenting a Problem-solver.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Statistical Reasoning: Probability and Bayes' Theorem – Certainty Factors and Rule-based Systems – Bayesian Networks – Dempster-Shafer Theory. Weak Slot-and-Filler Structures: Semantic Nets – Frames	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self -Study for Enrichment: (Not included for End Semester Examination) Conceptual Dependency – Scripts – CYC - Syntactic-semantic Spectrum of Representation – Logic and Slot-and-filler Structures – Other Representational Techniques – Summary of the Role of Knowledge	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. Elaine Rich, Kevin Knight and Shivashankar B Nair (2014). *Artificial Intelligence*, Third Edition, McGraw Hill Education (India) Private Limited.

Chapters and Sections

UNIT-I	Chapter 1 :	Sections 1.1 – 1.5
	Chapter 2 :	Sections 2.1- 2.6
UNIT-II	Chapter 3 :	Sections 3.1 – 3.6
UNIT-III	Chapter 4 :	Sections 4.1 – 4.2
	Chapter 5 :	Sections 5.1 – 5.3
UNIT-IV	Chapter 6 :	Sections 6.1 – 6.5
	Chapter 7 :	Sections 7.1 – 7.4
UNIT-V	Chapter 8 :	Sections 8.1 – 8.4
	Chapter 9 :	Sections 9.1 – 9.2

Reference Books

1. Stuart Russell and Peter Norvig (2003). *Artificial Intelligence A Modern Approach*, Pearson Education.

2. Patrick Henry Winston (2000). *Artificial Intelligence*, Pearson Education.
3. Dan W. Patterson (2008). *Introduction to Artificial Intelligence and Expert Systems*, Pearson Education.

Web References

1. <https://www.oracle.com/in/artificial-intelligence/what-is-ai/>
2. <https://www.ibm.com/topics/artificial-intelligence>
3. <https://www.techopedia.com/definition/190/artificial-intelligence-ai>
4. <https://www.simplilearn.com/tutorials/artificial-intelligence-tutorial/what-is-artificial-intelligence>
5. <https://www.gartner.com/en/topics/artificial-intelligence>

Pedagogy

Chalk and Talk, Power point presentation, Group Discussion, Seminar, Assignment and Quiz.

Course Designer

Ms. R. Soundaria

ALLIED
(2022-2023 ONWARDS)
V SEMESTER

CORE COURSE –VIII (CC)**BIOSTATISTICS****(2022-2023 Onwards)**

Semester V	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UBT5CC8	BIOSTATISTICS	CORE COURSE – VIII	6	6

Course Objective

- **Explain** the basic concepts of statistics and sampling design.
- **Emphasize** analytical thinking to solve biological problems.
- **Explore** the mathematical methods formatted for major concepts.

Course Outcomes**Course Outcome and Cognitive Level Mapping**

CO Number	CO Statement	Knowledge Level
CO1	On the successful completion of the course, students will be able to Explain the basic concepts of biostatistics.	K1, K2
CO2	Classify the data in the respective area.	K3
CO3	Solve various types of problems in the corresponding stream	K3
CO4	Identify the properties of solutions in the core area.	K3
CO5	Discover the applications of Statistics in Biology.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	2	3	3	3	3	3	3	3	3
CO3	3	2	3	3	3	3	3	3	2	3
CO4	3	3	2	2	3	3	3	2	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation –

“2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation

– “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Biostatistics: Definition of Biostatistics- Development of Biostatistics-Application of Biostatistics-Role of Biostatistics- Definition of Statistics – Descriptive and Inferential Statistics-Some Definitions Concerning Statistics Inference – Data and its Collection-Classification of Data- Several Meaning of Statistics – Characteristic of Statistics- Importance and Usefulness of Statistics- Limitation of Statistics Preliminary Concepts: Variables and Constants – Population and Samples - Random Samples – Discrete and Continuous Variables – Relationship and Prediction – Variables in Biology – Derived Variables, Ratio , Index and Rates – Levels of Measurements of Biological Data – Parameter and Statistic	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Tabulation and Frequency Distribution: Tabulation-Frequency Table of Frequency Distribution-Preparation of a Frequency Table-Relative Frequency Distribution-Cumulative Frequency Distribution. Graphical Representation of Data: Graphical Representation of Statistical Data-Advantages of Graphical Representation, Disadvantages of Graphical Representation-Types of Graphs-Modes of Graphical Representations of Data-Line Graph, Bar Diagram, Pie Chart(or) Circle Chart (or) Sector Chart-Pictograph (or) Pictogram-Graphical Representation of Grouped Data (Frequency Distribution)-Histogram-Construction of Histogram-Types of Histogram-Frequency Polygon-Comparison Between the Histogram and the Frequency Polygon-Frequency Curve- Cumulative Frequency Curve or Ogive.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Measures of Central Tendency: Measures of central tendency or average – Characteristics of an Ideal Measure of Central Tendency-Arithmetic Mean, -Mean of Raw Data, Mean of Grouped data, Shortcut Method, Step Deviation Method. Weighted Arithmetic Mean-Combined Mean-Corrected Mean-Merits, Demerits and Uses of Arithmetic Mean. Median: Calculation of Median- Calculation of Median for Grouped Data- Calculation of Median for	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	Continuous Series- Merits, Demerits and Uses of Median. Mode: Types of Model Series- Computation of Mode for Individual Series- Simple Series-Discrete frequency Distribution Series- Computation of Mode by Grouping Method- Computation of Mode in a Continuous frequency Distribution-Merits, demerits and Uses of Mode- Empirical Relation Between Mean, Median and Mode-Mid Range- Geometric Mean -Merits, Demerits and Uses of Geometric Mean. Measures of dispersion: variability – Range- Interquartile Range - Mean deviation (or) Average Deviation, Coefficient of Mean deviation -standard deviation-Merits, Demerits and Uses of Standard Deviation-Calculation of Standard Deviation –Individual Observation- Calculation of Standard Deviation –Discrete Series (or) Grouped Data- Calculation of Standard Deviation –Continuous Series.			
IV	Skewness, Moments and Kurtosis: Skewness- Definition of Skewness- Positively and Negatively Skewness-Purpose of Skewness-Difference Between Dispersion and Skewness - Measures of Skewness- Relative Measures- Karl Pearson's Coefficient of Skewness- Bowley's Coefficient of Skewness. Correlation Analysis: Correlation –Covariance –Calculation of Covariance- Correlation Analysis- Correlation and Coefficient of correlation-Properties of coefficient of correlation-correlation coefficient Calculated from Ungrouped Data-Spearman's Rank Correlation Coefficient. Regression Analysis: Regression Analysis – Regression Coefficients- Properties of Regression Coefficients.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	HYPOTHESIS TESTING AND LARGE SAMPLES TESTS: Students' t-Test: Introduction- Students' t-Distribution-Assumptions for t-Test-Properties of t- Distribution- Application of t-Distribution- Interval Estimate of Population Mean-Determination of Sample Size- Small (or Exact) Sample Tests-Computation of test Statistic: t- Values- Test of Significance of a Single Mean – Small Samples- Test of Significance of Difference between Two- Means Small Samples- Paired t- Test for Difference of Means (When the sample observations are not completely independent). Chi-Square Test: Chi-Square Test – Degrees of freedom- Chi-Square	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	Distribution-Properties of χ^2 - Distribution- χ^2 - Test- Uses of χ^2 Test- Conditions for Using the Chi-Square Test- χ^2-Test for Goodness of Fit- χ^2 Distribution of Sample Variance- Testing a hypothesis about the Variance of a Normally Distributed Population. F-test or Fisher's F test: F-test or Fisher's F test-F- Statistic- Assumptions in F- Test- Tests of Hypothesis about the Variance of two Populations. Design of Experiments-Completely Randomized Design (CRD) (or) One-Way Classification-Randomized Block Design (RBD) (or) Two- way Classification.			
VI	Self -Study for Enrichment: (Not included for End Semester Examination) Kind of Statisticians – Accuracy and Precision - Harmonic Mean- Merits, Demerits and Uses of Harmonic Mean- Limits of Variability– Standard Error of Estimate or Prediction – Linear Regression Line or Equation.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. Arora. P. N, Malhan. P.K. (2020). *Biostatistics*. Himalaya Publishing house.
2. Subramani. K, Santha.A. (2021). *Statistics for Management*. Scitech Publications (India) Pvt. Ltd.

Chapters and Sections

UNIT-I	Chapter 1: Sections 1.1-1.13 [1] Chapter 2: Sections 2.1-2.9 [1]
UNIT-II	Chapter 3: Sections 3.1-3.5 [1] Chapter 4: Sections 4.1-4.13[1]
UNIT-III	Chapter 5 Sections 5.1-5.22 [1] Chapter 6: Sections 6.1-6.10 [1]
UNIT- IV	Chapter 7: Sections 7. 1-7.9 [1] Chapter 8: Sections 8. 1-8.6 [1] Chapter 9: Sections 9. 1-9.3 [1]
UNIT- V	Chapter 13: Section 13.1-13.12 [1] Chapter 14: Section 14.1-14.10 [1] Chapter 15: Section 15.1-15.4 [1] Chapter 3: Sections 3.16-3.18 [2]

Reference Books

1. Bernard Rosner. (2006). *Fundamentals of Biostatistics*. Lengage learning.
2. Norman. T. J, Bailey (2009). *Statistical methods in biology*. University press Cambridge Rastogi.
3. Bernard Rosner. (2010). *Fundamentals of Biostatistics*. 7 th edition, Lengage learning.
4. Pillai. R. S. N, Bagavathi. V. (2016). *Statistics Theory and Practice*, S.Chand.

Web References

1. <https://www.pinterest.com/pin/applications-and-limitations-biostatistics--295056213081622305/>
2. <https://old.amu.ac.in/emp/studym/100019402.pdf>
3. <https://www.geeksforgeeks.org/measure-of-dispersion/>
4. https://www.cimt.org.uk/projects/mepres/alevel/stats_ch12.pdf
5. https://www.sagepub.com/sites/default/files/upm-binaries/40007_Chapter8.pdf
6. https://www.cimt.org.uk/projects/mepres/alevel/fstats_ch4.pdf
7. https://www.lkouniv.ac.in/site/writereaddata/siteContent/202004261258144523Anoop_Applied_ANNOVA.pdf
8. <https://www2.sci.u-szeged.hu/eghajlattan/pdf/11-12%20Statistical%20tests%20anova.pdf>

Pedagogy

Power point presentation, Group Discussion, Sseminar, Assignment.

CourseDesigners

Ms.P.Sangeetha

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

(Nationally Re-accredited (III cycle) with 'A' (CGPA 3.41 out of 4)

Grade by NAAC



PG AND RESEARCH DEPARTMENT OF MATHEMATICS

B.Sc MATHEMATICS SYLLABUS

2021-2022 ONWARDS

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
PROGRAMME OUTCOMES

PO1	Demonstrate basic manipulative skills in algebra, geometry and trigonometry.
PO2	Communicate mathematical principles and ideas with clarity and coherence, both written and verbally, demonstrating communication skills to be used in any future career.
PO3	Demonstrate proficiency in linear algebra, real and complex analysis as well as areas of modern, proof-based Mathematics.
PO4	Compute limits and derivatives using their definitions, and use the fundamental theorem of calculus to compute definite and indefinite integrals.
PO5	Construct counter examples to mathematical statements and understand the importance of hypotheses into a viable career path.

CAUVERY COLLEGE FOR WOMEN(AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS COURSE STRUCTURE
(For the candidates admitted in the year 2021-2022)

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam	Marks		Total
					Hrs		Hours	Int	Ext	
I	I	Language Course – I (LC) – Tamil*/Other Languages + #	இக்கால இலக்கியம்	19ULT1/ 19ULH1/ 19ULS1/ 19ULF1	6	3	3	25	75	100
			Story, Novel, History of Hindi Literature-I & Grammar – 1							
			History of Popular Tales Literature and Sanskrit Story							
			Communication in French –I							
	II	English Language Course - I (ELC)	Functional Grammar for Effective Communication –I	19UE1	6	3	3	25	75	100
	III	Core Course – I (CC)	Differential Calculus and Trigonometry	19UMA1CC1	5	5	3	25	75	100
		Core Course – II (CC)	Integral Calculus and Fourier Series	19UMA1CC2	6	6	3	25	75	100
		First Allied Course – I (AC)	Mathematical Statistics – I	19UMA1AC1	5	3	3	25	75	100
	IV	UGC Jeevan Kaushal Life skills	Universal Human Values	20UGVE	2	2	3	25	75	100
				TOTAL	30	22	-	-	-	600

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam Hours	Marks		Total
					Hrs			Int	Ext	
II	I	Language Course – II (LC) - Tamil*/Other Languages + #	இடைக்கால இலக்கியமும், புதினமும்	19ULT2/ 19ULH2/ 19ULS2/ 19ULF2	6	3	3	25	75	100
			Prose, Drama, History of Hindi Literature –II & Grammar - 2							
			Poetry, Textual Grammar and Alakara							
			Communication in French –II							
	II	English Language Course – II(ELC)	Functional Grammar for Effective Communication –II	19UE2	6	3	3	25	75	100
	III	Core Course – III (CC)	Analytical Geometry and Vector Calculus	20UMA2CC3	6	6	3	25	75	100
		First Allied Course – II (AP)	Mathematical Statistics-II (Practical)	19UMA2AC1P	5	3	3	40	60	100
		First Allied Course – III (AC)	Mathematical Statistics-III	19UMA2AC2	5	3	3	25	75	100
	IV	Environmental Studies	Environmental Studies	21UGES	2	2	3	25	75	100
	V	Extra Credit Course	Swayam Online Course	To be fixed Later	As Per UGC Recommendations					
				TOTAL	30	20	-	-	-	600

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam Hours	Marks		Total
					Hrs			Int	Ext	
III	I	Language Course – III (LC) – Tamil*/Other Languages +#	காப்பியமும், நாடகமும்	19ULT3/ 19ULH3/ 19ULS3/ 19ULF3	6	3	3	25	75	100
			Medieval, Modern Poem, Poetics & History of Hindi Literature – 3							
			Prose, Textual Grammar and Vakyarachana							
			Communication in French –III							
	II	English Language Course - III(ELC)	Reading and Writing For Effective Communication- I	19UE3	6	3	3	25	75	100
	III	Core Course – IV (CC)	Differential Equations and Laplace Transforms	19UMA3CC4	5	5	3	25	75	100
		Core Course – V (CC)	Classical Algebra and Theory of Equations	19UMA3CC5	5	5	3	25	75	100
		Second Allied Course – I (AC)	Python Programming	21UMA3AC3	4	4	3	25	75	100
		Second Allied Course – II (AP)	Python Programming LAB	21UMA3AC2P	2	2	3	40	60	100
	IV	Non Major Elective I – for those who studied Tamil under Part I	Mathematics for competitive Examinations-I	19UMA3NME1	2	2	3	25	75	100
		a) Basic Tamil for other language students	Basic Tamil	19ULC3BT1						
		b) Special Tamil for those who studied Tamil up to 10 th , +2 but opt for other languages in degree programme	Special Tamil	19ULC3ST1						
	V	Extra Credit Course	Swayam Online Course	To be fixed Later	As Per UGC Recommendations					
	TOTAL				30	24	-	-	-	700

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam Hours	Marks		Total
					Hrs			Int	Ext	
IV	I	Language Course – IV(LC) - Tamil*/Other Languages + #	பண்டைய இலக்கியம்	19ULT4/ 19ULH4/ 19ULS4/ 19ULF4	6	3	3	25	75	100
			Letter Writing, Precise Writing, General Essays, Technical Terms, Proverbs, Amplifications, Idioms & Phrases, History of Hindi Literature – 4							
			Drama, History of Drama Literature							
			Communication in French –IV							
	II	English Language Course – IV(ELC)	Reading and Writing For Effective Communication- II	19UE4	6	3	3	25	75	100
	III	Core Course – VI (CC)	Sequences and Series	21UMA4CC6	6	5	3	25	75	100
		Core Course – VII (CC)	Methods in Numerical Analysis	21UMA4CC7	4	3	3	25	75	100
		Second Allied Course – III (AC)	Internet of Things	21UMA4AC4	4	3	3	25	75	100
	IV	Skill Based Elective-I (SBE)	Introduction to R	21UMA4SBE1A	2	2	3	25	75	100
			Introduction to Statistical Tools and Techniques – SPSS	21UMA4SBE1B						
		Non Major Elective II – for those who studied Tamil under Part I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil up to10 th , +2 but opt for other languages in degree programme	Mathematics for competitive Examinations-II	19UMA4NME2	2	2	3	25	75	100
			Basic Tamil	19ULC4BT2						
			Special Tamil	19ULC4ST2						
	V	Extra Credit Course	Swayam Online Course	To be fixed Later	As Per UGC Recommendations					
	TOTAL				30	21	-	-	-	700

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam Hours	Marks		Total
					Hrs			Int	Ext.	
V	III	Core Course – VIII (CC)	Abstract Algebra	21UMA5CC8	6	5	3	25	75	100
		Core Course – IX (CC)	Real Analysis	21UMA5CC9	5	5	3	25	75	100
		Core Course – X (CC)	Statics	21UMA5CC10	5	4	3	25	75	100
		Core Course – XI (CC)	Discrete Mathematics	21UMA5CC11	4	3	3	25	75	100
		Major Based Elective- I	Fuzzy Set Theory and its Applications	21UMA5MBE1A	4	3	3	25	75	100
			Astronomy	21UMA5MBE1B						
			Artificial Intelligence	21UMA5MBE1C						
	IV	Skill Based Elective-II	Statistical Tools and Techniques – R Programming (Practical)	19UMA5SBE2AP	2	2	3	40	60	100
			Statistical Tools and Techniques – SPSS (Practical)	19UMA5SBE2BP						
		Skill Based Elective -III	LaTeX (Practical)	21UMA5SBE3AP	2	2	3	40	60	100
			Numerical methods with MATLAB Programming (Practical)	21UMA5SBE3BP						
		UGC Jeevan Kaushal Life Skills	Professional Skills	19UGPS	2	2	3	25	75	100
	V	Extra credit course	Swayam Online Course	To be fixed Later	As per UGC Recommendations					
	TOTAL				30	26	-	-	-	800

15 Days INTERNSHIP during Semester Holidays

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam Hours	Marks		Total
					Hrs			Int	Ext.	
VI	III	Core Course – XII (CC)	Linear Algebra	21UMA6CC12	5	5	3	25	75	100
		Core Course – XIII (CC)	Complex Analysis	21UMA6CC13	6	5	3	25	75	100
		Core Course – XIV (CC)	Dynamics	21UMA6CC14	5	5	3	25	75	100
		Core Course – XV (CC)	Operations Research	21UMA6CC15	5	4	3	25	75	100
		Major Based Elective-II	Graph Theory	21UMA6MBE2A	4	3	3	25	75	100
			Mathematical Modelling	21UMA6MBE2B						
			Fundamentals of Big Data Analytics	21UMA6MBE2C						
		Major Based Elective-III	Probability and Queuing Theory	21UMA6MBE3A	4	3	3	25	75	100
			Number Theory	21UMA6MBE3B						
			Web Technology	21UMA6MBE3C						
	V	Gender Studies	Gender Studies	19UGGS	1	1	3	25	75	100
		Extension Activities	Extension Activities	19UGEA	-	1	-	-	-	-
		Extra credit course	Internship	To be fixed Later	-					
	TOTAL				30	27	-	-	-	700
	GRAND TOTAL				180	140	-	-	-	4100

List of Allied Courses**Group I (Any one)**

1. Physics
2. Mathematical Statistics
3. Financial Accounting

Group II (Any one)

1. Chemistry
2. Computer Science
3. Management Accounting

Language Part – I	-	4	
English Part –II	-	4	
Core Paper	-	15	
Allied Paper	-	4	
Allied Practical	-	2	
Non-Major Elective	-	2	
Skill Based Elective	-	3	
Major Based Elective	-	3	
Environmental Studies	-	1	
Universal Human Values	-	1	
Professional Skills	-	1	
Gender Studies	-	1	
Extension Activities	-	1	(Credit only)

➤ For those who studied Tamil up to 10th, +2 (Regular Stream)

+ Syllabus for other Languages should be on par with Tamil at degree level

those who studied Tamil up to 10th, +2 but opt for other languages in degree level under Part I should study special Tamil in Part IV

** Extension Activities shall be outside instruction hours

Non Major Elective I & II – for those who studied Tamil under Part I

- a) Basic Tamil I & II for other language students
- b) Special Tamil I & II for those who studied Tamil up to 10th or +2 but opt for other languages in degree programme

Note:

	Internal Marks	External Marks
1. Theory	25	75
2. Practical	40	60
3. Separate passing minimum is prescribed for Internal and External marks		

FOR THEORY

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks]

FOR PRACTICAL

The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks]

The passing minimum for University Examinations shall be 40% out of 60 marks [i.e. 24 marks]

MAJOR BASED ELECTIVE - II
MATHEMATICAL MODELLING
2021-2022 Onwards

Semester VI	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
21UMA6MBE2B	MATHEMATICAL MODELLING	MAJOR BASED ELECTIVE	4	3

Course Objective

- **Analyze** the different mathematical models through Ordinary differential equation of first and second order.
- **Understand** the implementation of graph theoretical models.
- **Depict** the concepts of realworld problems.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand the basics of mathematical model and its process	K1
CO2	Explain the different classifications of mathematical models	K2
CO3	Predict the essential features and discuss the benefits of using a mathematical model	K3
CO4	Examine the applications of mathematical modelling to solve problems in Engineering, Physics, Biological and Social sciences	K4
CO5	Associate and interpret the results to real world problems.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	2	3	2	3
CO2	3	3	3	3	3	2	3	3	3	2
CO3	3	2	3	3	3	3	3	3	2	2
CO4	3	2	2	3	2	3	3	3	3	2
CO5	3	2	2	3	2	2	3	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Mathematical Modelling: Need, Techniques, Classification and Simple Illustrations The Technique of Mathematical Modelling – Classification of Mathematical Models – Some Characteristics of Mathematical Models – Mathematical Modelling through Geometry – Mathematical Modelling through Algebra – Mathematical Modelling through Trigonometry.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Mathematical Modelling through Ordinary Differential Equations of First order Mathematical Modelling through Differential Equations – Linear growth and Decay Models – Non-Linear Growth and Decay Models – Compartment Models – Mathematical Modelling in Dynamics through Ordinary Differential Equations of First Order.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Mathematical Modelling through Systems of Ordinary Differential Equations of the First Order Mathematical Modelling in Population Dynamics – Mathematical Modelling of Epidemics through Systems of Ordinary Differential Equations of First Order – Compartment Models through Systems of Ordinary Differential Equations – Mathematical Modelling in Economics through Systems of Ordinary Differential Equations – Mathematical Models in Medicine, Arms Race, Battles and International Trade in terms of Systems of Ordinary Differential Equation	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Mathematical Modelling through Ordinary Differential Equations of Second Order	12	CO1, CO2, CO3,	K1, K2, K3, K4

	Mathematical Modelling of Planetary Motions – Mathematical Modelling of Circular Motion and Motion of Satellites – Mathematical Modelling through Linear Differential Equations of Second Order.		CO4, CO5	
V	Mathematical Modelling through Graphs Situations that can be Modelled through Graphs – Mathematical Models in terms of Directed Graphs – Mathematical Models in terms of Signed Graphs – Mathematical Modelling in terms of Weighted Digraphs.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. J. N. Kapur, (2001). Mathematical Modelling, New age international(P) Limited, Publishers

Chapters and Sections

- UNIT–I Chapter 1: Sections 1.2 to 1.7
- UNIT II Chapter 2: Sections 2.1 to 2.5
- UNIT-III Chapter 3: Sections 3.1 to 3.5
- UNIT-IV Chapter 4: Sections 4.1 to 4.3
- UNIT-V Chapter 7: Sections 7.1 to 7.4

Reference Books

1. Bimal K.Mishra & Dipak K.Satpathi (2021). *Mathematical Modeling Applications, Issues and Analysis*, Ane Books Pvt. Ltd.
2. Edward A. Bender (2019). *An Introduction to Mathematical Modelling*, Dover Publications.
3. Rutherford Aris (2022), *Mathematical Modelling Techniques*, Dover Publications.
4. Clive L.Dym (2006), *Principles of Mathematical Modelling*, Academic Press.

Web References

1. <https://youtu.be/df5EK1P6Ph0?t=375>

2. <https://youtu.be/df5EK1P6Ph0?t=5>
3. <https://youtu.be/hGJUfUfu9mA>
4. https://youtu.be/Z_u6jSgCH-0?t=104
5. <https://youtu.be/FBvky0jAdmA?t=774>
6. <https://youtu.be/wjOOrr2uPuU?t=29>
7. <https://youtu.be/MDeTiyn3rz4?t=39>

Pedagogy

Power point presentation, Group discussion, Seminar, Assignment.

Course Designer

Dr. V. Geetha

MAJOR BASED ELECTIVE – II
FUNDAMENTALS OF BIG DATA ANALYTICS
2021-2022 Onwards

Semester – VI	FUNDAMENTALS OF BIG DATA ANALYTICS	Hours/Week -4	
Major Based Elective - II		Credits - 3	
Course Code - 21UMA6MBE2C		Internals 25	Externals 75

Course Objectives

- **Inculcate** a strong foundation on basic concepts of Big Data.
- **Understand** the components of Hadoop framework and MapReduce
- **Explore** Big Data analytics tools.

Course Outcomes

CO Number	CO Statement On the successful completion of the course, the students will be able to,	Knowledge Level
CO1	Understand the Big Data phenomenon.	K2
CO2	Explain the various Big Data tools.	K2
CO3	Classify the use of predictive analytics on big data.	K2
CO4	Identify the potential use of Big Data in corporate environment.	K4
CO5	Analyze large scale data.	K4

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1	M	S	M	M	S
CO2	M	S	M	M	S
CO3	M	S	M	M	S
CO4	M	S	M	M	S
CO5	M	S	M	M	S

S-Strong; M-Medium; L-Low;

Syllabus

UNIT I

(12 HOURS)

OVERVIEW OF BIG DATA: Defining Big data - Big data Types-Analytics-Industry Examples of Big data and Data Risk- Big data Technologies- The Benefits of Big data.

UNIT II

(12 HOURS)

BASICS OF HADOOP: Big data and Hadoop- Hadoop Architecture- Main components of Hadoop Framework-Analyzing Big data with Hadoop-Distributed Application concept- Hadoop Distributed File system-Advantages of Hadoop- Ten Big Hadoop Platforms.

UNIT III

(12 HOURS)

NO SQL DATA MANAGEMENT AND MONGODB:No SQL Data Management- Types of No SQL Databases- Choosing a query model for Bigdata- Benefits of NoSQL- MongoDB- Advantages of MongoDB over RDBMS.

UNIT IV

(12 HOURS)

HBASE AND CASSANDRA, MAPREDUCE: Introduction to HBASE- HBASE Architecture- HBASE data model- Cassandra:Introduction- Features of Cassandra- data replication in Cassandra – Components of Cassandra- MapReduce: Introduction to MapReduce – How MapReduce works – Map operations.

UNIT V

(12 HOURS)

DATA STREAM MINING: Data Stream mining- the Stream Data Model- Stream Applications-Data models and query language for streams- Continuous query processing and optimization- Distributed query processing- Data Stream v/s conventional stored relation model.

Text book:

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1.	V.K. JAIN	BIG DATA AND HADOOP	KHANNA BOOK PUBLISHING CO.(P) LTD	2017

CHAPTERS AND SECTIONS:

UNIT	CHAPTERS	SECTIONS
I	1	1.2,1.4-1.7,1.10,1.16
II	2	2.1-2.6,2.16,2.20
III	5	5.1-5.6,5.10
IV	6	6.1,6.4,6.5,6.8,6.9,6.11,6.12
	7	7.1-7.3
V	14	14.1-14.7

Reference Books:

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1.	Bart Baesens	Analytics in a Big Data world	Wiley Big Data Series	2014
2.	Thomas Erl Wajid Khattak and Paul Buhler	Big Data Fundamentals: Concepts, Drivers & Techniques	Pearson	2016
3.	Raj Kamal and Preeti Saxena	Big data Analytics	McGraw Hill Education Private Ltd.,	2019

Weblinks:

1. <https://youtu.be/LkEQQwVsET8>
2. <https://appinventiv.com/blog/hbase-vs-cassandra/#:~:text=HBase%20has%20a%20master%2Dbased,once%20the%20master%20is%20down.>
3. <https://hevodata.com/learn/data-streams-in-data-mining/>
4. <https://youtu.be/aReuLtY0YMI>
5. <https://youtu.be/nJRrNb4ZaUM>
6. <https://youtu.be/DrLJwSci6b8>
7. <https://youtu.be/JZGtV278SvE>

Pedagogy:

Chalk and Talk, PPT, Discussion, Assignment, Quiz and Seminar.

Course Designer

Dr. P.Saranya

MAJOR BASED ELECTIVE – III
PROBABILITY AND QUEUEING THEORY
(2021-2022 Onwards)

Semester - VI	PROBABILITY AND QUEUEING THEORY	Hours/Week -4	
Major Based Elective - III		Credits – 3	
Course Code - 21UMA6MBE3A		Internals 25	Externals 75

Objectives

- **Understand** the various features of Probability.
- **Analyze** the solutions using Probability.
- **Explore** the concepts of Queueing Theory in real life problems.

Course Outcomes

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamental concepts of Probability and Acquire Knowledge of Standard distribution which can describe real life phenomena.	K1
CO2	Identify various distribution functions and acquire skills in handling situations involving more than one variable	K2
CO3	Apply the basic characteristics features of a queueing system and acquire skills in analyzing queueing models	K3
CO4	Analyze the various Classifications of Random Processes and Characterized phenomena which evolve with respect to time in Probabilistic manner	K4
CO5	Deduce the different queueing models and its applications	K5

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	S
CO2	S	S	S	S	M
CO3	S	M	S	M	M
CO4	S	S	M	S	M
CO5	S	S	S	M	M

S-Strong; M-Medium; L-Low;

Syllabus

UNIT I

Random Variables:

(12 HOURS)

Random Variables

Discrete Random variable – Probability Function – Continuous Random variable – Probability Density Function – Cumulative Distribution Function (cdf) – Properties of the cdf $F(x)$ – Special Distributions – Discrete Distributions – Continuous Distributions – Two – Dimensional Random Variables – Probability Function of (X, Y) – Joint Probability Density function – Cumulative Distribution Function – Properties of $F(x,y)$ – Marginal Probability Distribution – Conditional Probability Distribution

UNIT II

(12 HOURS)

Some Special Probability Distributions:

Introduction – Special Discrete Distributions – Mean and Variance of the Binomial Distribution – Recurrence formula for the Central Moments of the Binomial Distribution – Poisson Distribution as limiting form of Binomial Distribution - Mean and Variance of Poisson Distribution - Recurrence formula for the Central Moments of the Poisson Distribution - Mean and Variance of Geometric Distribution – Special Continuous Distributions – Moments of the Uniform Distribution $U(a,b)$ - Mean and Variance of the Exponential Distribution – Memoryless Property of the Exponential Distribution - Mean and Variance of Erlang Distribution.

UNIT III

(12 HOURS)

Special Random Processes:

Poisson Process – Probability Law for the Poisson Process $\{X(t)\}$ – Second-Order Probability Function of a Homogenous Poisson Process – Mean and Autocorrelation of the Poisson Process – Properties of Poisson Process – Markov Process – Definition of a Markov Chain - Chapman-kolmogorov Theorem – Classification of States of a Markov Chain – Probability Distribution of $X(t)$.

UNIT IV

(12 HOURS)

Special Random Processes:

Mean and Variance of the Population Size in a Linear Birth and Death Process – Pure Birth Process – Queueing Processes – Renewal Process – Probability Distribution of the Number of Renewals, $N(t)$ and $E\{N(t)\}$ – Renewal Equation – Poisson Process as a Renewal Process.

UNIT V

(12 HOURS)

Queueing Theory:

Symbolic Representation of Queueing Model – Difference Equations Related to Poisson Queue Systems – Values of P_0 and P_n for Poisson Queue Systems – Characteristics of Infinite Capacity,

Single Server Poisson Queue Model I $[(M/M/1):(\infty/FIFO)$ Model], when $\lambda_n = \lambda$ and

$\mu_n = \mu (\lambda < \mu)$ - Relations Among $E(N_s)$, $E(N_q)$, $E(W_s)$ and $E(W_q)$ – Characteristics of Infinite

Capacity, Multiple Server Poisson Queue Model II $[(M/M/S):(\infty/FIFO)$ Model], when $\lambda_n = \lambda$ for all $n (\lambda < s\mu)$ - Characteristics of Finite Capacity, Single Server Poisson Queue Model III

$[(M/M/1):(k/FIFO)$ Model] - Characteristics of Finite Queue, Multiple Server Poisson Queue Model IV $[M/M/S):(k/FIFO)$ Model]

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1.	T. Veerarajan	Probability, Statistics and Random Processes with Queueing Theory and Queueing Networks	Tata Mc-Graw Hill Education Pvt. Ltd., New Delhi.	2010

Chapters and Sections:

Unit - I	Chapter 2: Page No. 2.1 - 2.5, 2.23 - 2.26
Unit - II	Chapter 5: Page No. 5.1 - 5.4, 5.6, 5.8, 5.14, 5.36 - 5.40
Unit - III	Chapter 7: Page No. 7.33 - 7.38, 7.45 - 7.50
Unit - IV	Chapter 7: Page No. 7.54 - 7.68
Unit - V	Chapter 8: Page No. 8.3 - 8.5, 8.10, 8.15, 8.18

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1.	V. Sudarapandian	Probability, Statistics and Queueing theory	PHI Learning Private Limited, Delhi.	2013
2.	A. Singaravelu, C. Vijayalakshmi	Probability and Queueing theory	Meenakshi Agency, Chennai.	2003

Web References

- 1 https://youtu.be/m_BspKtRTJs?si=zxPyEOd6T-Ua_7Z2
- 2 <https://youtu.be/xGkpXk-AnWU?si=ZZuMUnhhO5d7aTrI>
- 3 https://youtube.com/@npteliitguwahati8283?si=X6RF-imCi_4Y6xIV
- 4 <https://byjus.com/maths/probability-density-function>
- 5 <https://www.investopedia.com/terms/q/queueing-theory.asp>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. E. LITTA

MAJOR BASED ELECTIVE – III
FUNDAMENTALS OF BIG DATA ANALYTICS
2021-2022 Onwards

Semester VI	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
21UMA6MBE3C	Web Technology	MBE	4	3

Course Objective

- To impart knowledge in scripting
- To establish adequate formatting and styles
- To design web pages and web sites

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Discover the basic concepts of web technology	K1
CO2	Summarize the components of web design	K2
CO3	Identify the different type of tags and styles to create web pages	K3
CO4	Apply scripting language concepts	K4
CO5	Construct websites using HTML and Cascading Style Sheets	K5

Mapping of CO with PO and PSO

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1	3	3	2	3	1
CO2	3	2	3	2	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	2	2	2	3	3	2	3	1
CO5	2	3	3	2	2	2	3	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	Contents	HOURS	COs	COGNITIVE LEVEL
I	Get Started in HTML: Meet HTML – Understand structure -Create Documents – Add Styles – Include Scripts – Link Resources. Structure Web Pages: Proclaim Headings – Group Headings – Include Navigation – Complete framework – Create sections – Provide Asides – Revision Divisions	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Manage Text Content: Insert Paragraphs – Include Quotations – Add Emphasis – Add Modifications – Add Phrasing – Retain Formatting – Use Superscript – Display Code – Direct Language – Create Hyperlinks – Access Keys - Fragment Links – Protocol Links. Write Lists and Tables: Unordered Lists – Ordered Lists – Description Lists – Basic Tables – Span Cells – Enhance Tables – Control Columns	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Incorporate Media Content: Add Image – Image Maps – Reference Figures – Select Pictures – Embed Objects – Embed Vectors – Embed Frames – Add Audio - Add Video –Insert Slots – Employ Dialogs – Paint Canvas. Produce Input Forms: Submit Text – Input Types – Text Areas – Check Boxes – Hide Data – Upload Files – Push Buttons – Image Buttons – Add Logos – Select Options – Datalist Options – Label Controls	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Get Started in CSS: Meet CSS - Create Rules – Apply Rules – Select Type - Select Class – Select Identity – Select Relatives – Select Attributes – Paint Colors – Set Backgrounds. Manipulate Text Content: Suggest Font – Set Size – Vary Style – Use Shorthand - Align Text– Decorate Text – Change Direction - Enhance Text – Number Sections	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	Introduction to JavaScript: JavaScript in Web Pages – Advantages of JavaScript – Writing JavaScript into HTML – Basic Programming Techniques - Operators and Expressions In JavaScript - JavaScript Programming Constructs - Conditional Checking - Super Controlled - Endless Loops - Functions In JavaScript - User Defined Functions - Placing Text In A Browser - Dialog Boxes.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text books

1. Mike McGrath. (2020). *HTML, CSS & JavaScript in Easy Steps*, Special Edition, In Easy Steps Limited. **(Unit I - IV)**
2. Ivan Bayross. (Reprint 2021). *Web enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP*, 4th Revised Edition, BPB Publications, New Delhi. **(Unit V)**

Reference Books

1. Ben Frain. (2020). *Responsive Web Design with HTML5 and CSS*, 3rd Edition, Packt Publishing Ltd. UK.
2. Julie C Meloni, Jennifer Kymin. (2018). *HTML, CSS, and JavaScript All in One*, 3rd Edition, Pearson Education.

Web References

1. <https://www.tutorialspoint.com/html5/index.htm>
2. <https://www.javatpoint.com/html5-tutorial>
3. <https://www.geeksforgeeks.org/JavaScript/>

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar

Course Designer

Ms.A.Jabeen, Assistant Professor, Department of Computer Applications

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with 'A' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

PG AND RESEARCH DEPARTMENT OF MATHEMATICS



M. Sc. MATHEMATICS

AUTONOMOUS SYLLABUS

2023 – 2024 and onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS

VISION

To strive for excellence in the mathematical sciences in addition to encourage people to undertake opportunities in transdisciplinary domains.

MISSION

- To enhance analytical and logical problem-solving capabilities.
- To provide excellent mathematical science knowledge for a suitable career and to groom students for national prominence.
- To teach students how to use data analytics.
- To prepare students for transdisciplinary research and applications.
- Value-based education and service-oriented training programmes are used to acquire life skills.

PROGRAMME EDUCATIONAL OBJECTIVES(PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc MATHEMATICS

PO NO.	On completion of M.Sc Mathematics, the students will be able to
PO 1	Problem Analysis Provide opportunities to develop innovative design skills, including the ability to formulate problems, to think creatively, to synthesize information, and to communicate effectively.
PO 2	Scientific Skills Create and apply advanced techniques and tools to solve the societal environmental issues.
PO 3	Environment and Sustainability Ascertain eco-friendly approach for sustainable development and inculcate scientific temper in the society.
PO 4	Ethics Imbibe ethical and social values aiming towards holistic development of learners.
PO 5	Life long learning Instill critical thinking, communicative knowledge which potentially leads to higher rate of employment and also for higher educational studies.

PROGRAMME SPECIFIC OUTCOMES FOR M.Sc MATHEMATICS

PSO NO.	The Students of M.Sc Mathematics will be able to	POs Addressed
PSO1	Make a significant contribution to society's development through mathematical study	PO1 PO2 PO3
PSO2	Provide an in-depth and extensive functional understanding of mathematical basics.	PO1
PSO3	Develop the experimental abilities in order to solve scientific and technical problems.	PO1 PO5
PSO4	Promote the learners and explore the potential in emerging fields.	PO4 PO5
PSO5	Enhance problem-solving, thinking, and creative skills through assignments and project work.	PO4 PO5



Cauvery College for Women (Autonomous), Trichy-18
PG & Research Department of Mathematics
M.Sc Mathematics
Learning Outcome Based Curriculum Framework (CBCS-LOCF)
For the Candidates admitted from the Academic year
2023-2024 onwards

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Hrs.	Exam		Total
							Marks		
							Int.	Ext.	
I	Core Course– I (CC)	Algebraic Structures	23PMA1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Real Analysis I	23PMA1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Ordinary Differential Equations	23PMA1CC3	6	5	3	25	75	100
	Core Course - IV (CC)	Probability Theory	23PMA1CC4	6	5	3	25	75	100
	Discipline Specific Elective Course-I (DSE)	A. Number Theory and Cryptography	23PMA1DSE1A	6	3	3	25	75	100
		B. Graph Theory and Applications	23PMA1DSE1B						
		C. Programming in C++ and Numerical Methods	23PMA1DSE1C						
	Total				30	23	-	-	-

15 Days INTERNSHIP during Semester Holidays

Semester	Course	Course Title	Course Code	Inst.	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
II	Core Course– (CC)	Advanced Algebra	23PMA2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Real Analysis II	23PMA2CC6	6	5	3	25	75	100
	Core Course - VII (CC)	Linear Algebra	23PMA2CC7	6	5	3	25	75	100
	Core Choice Course– I (CCC)	A. Partial Differential Equations	22PMA2CCC1A	6	4	3	25	75	100
		B. Mathematical Programming	22PMA2CCC1B						
		C. Difference Equations	22PMA2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A. Computational Mathematics Using MATLAB (P)	22PMA2DSE2AP	6	3	3	40	60	100
		B. Advanced Numerical Methods Using MATLAB (P)	23PMA2DSE2BP						
		C. Ordinary Differential Equations and Partial Differential Equations Using MATLAB (P)	22PMA2DSE2CP						
	Internship	Internship	22PMA2INT	-	2	-	-	100	100
Extra Credit Course	SWAYAM	As per UGC’s Recommendation							
Total				30	24	-	-	-	600

Semester	Course	Course Title	Course Code	Inst.Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
III	Core Course–VIII (CC)	Topology	22PMA3CC8	6	5	3	25	75	100
	Core Course – IX (CC)	Discrete Mathematics	22PMA3CC9	6	5	3	25	75	100
	Core Course - X (CC)	Measure and Integration	22PMA3CC10	6	4	3	25	75	100
	Core Choice Course– II (CCC)	A. Cyber Security	22PGCS3CCC2A	3(T) + 2(P)	4	3	25	75	100
		B. Introduction to Coding Theory	22PMA3CCC2B	5					
		C. Mechanics	22PMA3CCC2C						
	Discipline Specific Elective Course-III (DSE)	A. Analytical Skills for Competitive Examinations	22PMA3DSE3A	4	3	2	-	100	100
		B. Stochastic Processes	22PMA3DSE3B			3	25	75	
		C. Fuzzy Sets and their Applications	22PMA3DSE3C						
	Generic Elective Course -I (GEC)	Foundation for Logical Thinking	22PMA3GEC1	3	2	3	25	75	100
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total				30	23	-	-	-	600

IV	Core Course– XI(CC)	Complex Analysis	22PMA4CC11	6	5	3	25	75	100
	Core Course - XII(CC)	Functional Analysis	22PMA4CC12	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. Differential Geometry	22PMA4CCC3A	6	4	3	25	75	100
		B. Formal Language and Automata Theory	22PMA4CCC3B						
		C. Fluid Dynamics	22PMA4CCC3C						
	Generic Elective Course-II (GEC)	Optimization Techniques	22PMA4GEC2	3	2	3	25	75	100
	Project	Project Work	22PMA4PW	9	4	-	-	100	100
	Extension Activity		23PGEA	-	1	-	-	-	-
	Total			30	21	-	-	-	500
	Grand Total			120	91	-	-	-	2200

Courses & Credits for PG and Research Department of Mathematics

S. No	Courses	No of Courses	No of Credits	Marks
1.	Core Course– (CC)	12	59	1200
2.	Core Choice Course– (CCC)	3	12	300
3.	Discipline Specific Elective- (DSE)	3	9	300
4.	Generic Elective Course - (GEC)	2	4	200
5.	Project	1	4	100
6.	Internship	1	2	100
7.	Extension Activity	-	1	-
	Total	22	91	2200

Students will go for internship after completing the I Semester exams and the internship will be calculated in the II Semester and credits for internship is 02.

For each Semester marks will be for 500(600 for II Semester due to internship and 600 for III Semester also)

The internal and external marks for theory and practical papers are as follows:

Subject	Internal	External
Theory	25	75
Practical	40	60

Separate passing minimum is prescribed for Internal and External

For Theory:

- The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks).
- The passing minimum for End Semester Examination shall be 40% out of 75 marks (i.e. 30 marks).
- The passing minimum not less than 50% in the aggregate.

For Practical:

- The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e. 24 marks)
- The passing minimum not less than 50% in the aggregate.

For Project:

Project : 100 Marks
Dissertation : 80 Marks
Viva Voce : 20 Marks

CORE COURSE – V (CC)
ADVANCED ALGEBRA
(2023-2024 Onwards)

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
23PMA2CC5	ADVANCED ALGEBRA	CORE	6	5

Course Objective

- **Learn** the fundamentals in Galois theory.
- **Expertise** and confidence in proving theorems to progress in Galois theory.
- **Familiarize** the concepts of Galois group.

Prerequisite

Basic knowledge of Algebra.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able To	
CO1	Analyse the important concepts of Galois theory and identify through various examples.	K1, K2, K3
CO2	Predict the notions and their connections of Galois theory.	K3
CO3	Examine the proof of solvability by Galois theory.	K4
CO4	Evaluate clear cut idea in Galois theory extensions and illustrate through examples.	K5
CO5	Learn and conclude Galois theory correspondence theorem of algebra.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	2	2	2
CO2	3	3	3	2	2	3	3	3	2	2
CO3	3	3	3	3	3	3	3	2	3	3
CO4	2	2	3	3	3	2	2	3	3	3
CO5	2	2	3	3	3	2	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Quotient Rings - Polynomial Rings over Fields - Prime Ideals and Maximal Ideals - Irreducible Polynomials.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Classical Formulas - Splitting Fields.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	The Galois Group - Roots of Unity - Solvability by Radicals.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Independence of Characters - Galois Extensions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	The Fundamental Theorem of Galois Theory – Galois's Great Theorem.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not included for End Semester Examinations) Rings - Domains and Fields - Homomorphism and Ideals - Quotients Rings- Polynomial Rings over Fields- Applications	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

Joseph Rotman (2010), *Galois Theory*, 2nd Edition, Springer International Edition.

Chapters and Pages

UNIT I	Pages 21 - 43
UNIT II	Pages 44 - 58
UNIT III	Pages 59 - 75
UNIT IV	Pages 76 - 82
UNIT V	Pages 83, 84, 90 - 95

Reference Books

1. David S. Dummit and Richard M. Foote (2017), *Abstract Algebra* (Third Edition), John Wiley & Sons.
2. John B. Fraleigh (2003), *A First Course in Abstract Algebra* (Seventh Edition), Pearson Education.
3. I. N. Herstein (2016), *Topics in Algebra* (3rd Edition), John Wiley & Sons.

Web References

1. <https://nrich.maths.org/1422>
2. <https://www.math3ma.com/blog/what-is-galois-theory-anyway>
3. https://people.math.harvard.edu/~elkies/M250.01/galois_topix.html
4. <https://www.maths.ed.ac.uk/~tl/gt/gt.pdf>
5. <https://mathoverflow.net/questions/34125/is-galois-theory-necessary-in-a-basic-graduate-algebra-course>

Pedagogy

Power point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. K. Kalaiarasi

CORE COURSE – VI (CC)

REAL ANALYSIS II

(2023 – 2024 Onwards)

Semester II	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
23PMA2CC6	REAL ANALYSIS II	CORE	6	5

Course Objectives

- **Define** the notion of metric space, limits of a function, continuous function and component of a metric space.
- **Explore** the fundamental concepts of derivatives of vector-valued functions.
- **Apply** the idea of matrix representation using linear function.

Prerequisite

Fundamental concepts of Real Analysis

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Explain various mathematical proof of basic results in real analysis.	K2
CO2	Apply the properties of real numbers that lead to the formal development of real analysis.	K3
CO3	Ascertain the concepts of different types of derivatives and partial derivatives.	K4
CO4	Evaluate the concepts of limits, continuity and implicit function that can be applied to important practical problems.	K5
CO5	Develop the important concepts of real analysis.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	2	3	3	2	3
CO3	3	3	3	3	3	2	3	2	3	3
CO4	3	3	3	3	3	3	3	2	2	3
CO5	3	3	3	3	3	3	2	3	3	3

“1”–Slight(Low)Correlation–

“2”–Moderate(Medium) Correlation–

“3”–Substantial(High)Correlation–

“-”indicatesthereisnocorrelation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Limits: Introduction–Convergent sequences in a metric space – Cauchy sequences – Complete metric spaces – Limit of a function – Limits of complex-valued functions. Continuity: Continuous functions – Continuity of composite functions – Continuous complex-valued and vector-valued functions – Examples of continuous functions.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
II	Continuity: Continuity and inverse images of open or closed sets – Functions continuous on compact sets – Topological mappings (homeomorphisms) – Bolzano’s theorem – Connectedness – Components of a metric space – Arcwise connectedness – Uniform continuity – Uniform Continuity and compact sets – Fixed-point theorem for contractions.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
III	Derivatives: Introduction – Definition of derivative – Derivatives and continuity – Algebra of derivatives – The chain rule – One-sided derivatives and infinite derivatives – Functions with nonzero derivative –Zero derivatives and local extrema – Rolle’s theorem – The Mean-Value Theorem for derivatives – Intermediate-value theorem for derivatives – Taylor’s formula with remainder – Partial derivatives – Differentiation of functions of a complex variable – The Cauchy-Riemann equations.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
IV	Multivariable Differential Calculus: Introduction – The directional derivative – Directional derivatives and continuity – the total derivative – The total derivative expressed in terms of partial derivatives – An application to complex-valued functions – The matrix of a linear function – The Jacobian matrix – The chain rule – Matrix form of the chain rule – The Mean-value Theorem for differentiable functions – A Sufficient condition for differentiability – A sufficient condition for equality of mixed partial derivatives.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
V	Implicit Functions and Extremum Problems Introduction – Functions with nonzero Jacobian determinant – The inverse function theorem – The implicit function theorem – Extrema of real-valued functions of one variable – Extrema of real-valued functions of several variables – Extremum problems with side conditions.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Limits of vector-valued functions - Discontinuities of real-valued functions - Derivatives of vector-valued functions - Taylor’s formula for functions from R^n to R^1	-	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6

Text Book

Tom M. Apostol.(2002).*Mathematical Analysis (Second Edition 20th Reprint)*, Narosa Publishing House.

Chapters and Sections

UNIT-I	Chapter 4:	Sections 4.1– 4.6, 4.8 – 4.11
UNIT-II	Chapter 4:	Sections 4.12 – 4.21
UNIT-III	Chapter 5:	Sections 5.1 – 5.12, 5.14 – 5.16
UNIT- IV	Chapter 12:	Sections 12.1 – 12.13
UNIT-V	Chapter 13:	Sections 13.1 – 13.7

Reference Books

1. Robert G. Bartle and Donald R. Sherbert. (2019). *Introduction to Real Analysis (Fourth Edition)*. Wiley India Pvt. Limited.
2. Royden H. L. (2003). *Real Analysis (Third Edition, Ninth Reprint)*. Prentice-Hall of India Private Limited, New Delhi.
3. Walter Rudin. (1986). *Principles of Mathematical Analysis (Third Edition)*. McGraw-Hill Book Company.

Web References

1. https://youtu.be/kjpPaKKMJqQ?si=zRjTO-30wx-B_3Y-
2. <https://youtu.be/59tydOl49Mw?si=p31co7vxk9rOqQH>
3. https://youtu.be/ZVUOow92hpo?si=rdKPGg_76Up5ar19
4. <https://youtu.be/IFtjDDB8fzo?si=rG1C6fypshWxZBfz>
5. <https://youtu.be/EJZMPdoYWwc?si=81OokEBqlkdWRksS>
6. <https://youtu.be/LWk7hvY1Goc?si=u4mGKT7v9OSri15j>
7. <https://youtu.be/mslZz8ydzcM?si=VJrvjcANdq4TqNvf>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. P. Shalini

CORE COURSE– VII(CC)
LINEAR ALGEBRA
(2023-2024 Onwards)

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
23PMA2CC7	LINEAR ALGEBRA	CORE	6	5

Course Objectives

- **Acquire** knowledge related to basic concepts.
- **Develop** rational thinking patterns in terms of problem-solving in competitive exams.
- **Emphasis** on knowledge of the various aspects of Linear Algebra.

Prerequisite

Basic Knowledge of algebra and vector space.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Remember and recall the basic concepts of vector space.	K1
CO2	Illustrate the various techniques of problem-solving in respective stream.	K2
CO3	Apply different terminologies of linear algebra.	K3
CO4	Classify the various properties in transformation.	K4
CO5	Interpret the problems involved in vector spaces.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	2	3	2	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	2	2	3	2	3	3	3	2	2	3
CO4	2	2	2	2	3	2	2	2	2	3
CO5	3	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Linear Equations: Systems of Linear Equations – Matrices and Elementary Row Operations – Row - Reduced Echelon Matrices – Invertible Matrices – Bases and Dimension.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Linear Transformations: Linear Transformations - The Algebra of Linear Transformations – Isomorphism – Representation of Transformations by Matrices – Linear Functionals – The Transpose of a Linear Transformation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Determinants: Commutative Rings – Determinant Functions - Permutations and the Uniqueness of Determinants – Additional Properties of Determinants.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Elementary Canonical Forms: Characteristic Values – Annihilating Polynomials - Invariant Subspaces – Direct-Sum Decompositions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Operators on Inner Product Spaces: Forms on Inner Product Spaces – Positive Forms – More on Forms – Spectral Theory.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self -Study for Enrichment: (Not included for End Semester Examination) Matrix Multiplication – Vector Spaces - The Double Dual – Inner Product Spaces - Further Properties of Normal Operators.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

Kenneth Hoffman and Ray Kunze (1975). *Linear Algebra*, Second Edition, PHI Learning Private Limited, New Delhi.

Chapters and Sections

UNIT-I	Chapter 1: Sections 1.2 – 1.4, 1.6 Chapter 2: Sections 2.3
UNIT-II	Chapter 3: Sections 3.1 – 3.5, 3.7
UNIT-III	Chapter 5: Sections 5.1 – 5.4
UNIT- IV	Chapter 6: Sections 6.2 – 6.4, 6.6.
UNIT- V	Chapter 9: Sections 9.2 - 9.5.

Reference Books

1. Kumaresan S(January 2018). *Linear Algebra: A Geometric Approach*, Prentice – Hall of India Ltd.
2. Keshawa Prasad Gupta(2008). *Linear Algebra*, Pragati Prakashan, Fifteenth Revised Edition.
3. Edgar Goodaire G(2014). *Linear Algebra*, Pure & Applied World Scientific, Cambridge University Press India Ltd.

Web References

1. <https://youtu.be/Pc2dWW3aSrk>
2. <https://youtu.be/shs8lWDOBHO>
3. <https://youtu.be/nPOooyrM5is>
4. <https://youtu.be/uJNQPgYjlQc>
5. <https://youtu.be/6PEKr7vWsrw>
6. <https://ksuweb.kennesaw.edu>
7. <https://www.math.hkust.edu.hk/~mabfchen/Math111/Week13-14.pdf>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Ms.V.ManiMozhi

DISCIPLINE SPECIFIC ELECTIVE COURSE – II
ADVANCED NUMERICAL METHODS USING MATLAB(P)
2023-2024 onwards

SemesterII	InternalMarks:40		ExternalMarks:60	
COURSECODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
23PMA2DSE2BP	ADVANCED NUMERICAL METHODS USING MATLAB(P)	DISCIPLINE SPECIFIC ELECTIVE COURSE - II	6	3

Course Objectives

- To provide software that enables the investigation and testing of mathematical structures.
- It is versatile for users to solve various equation systems.
- To gain powerful user support.

Pre requisite

- Basic knowledge of Higher Mathematics

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Remember the concepts of Numerical Analysis	K1
CO2	Compute the numerical integration problems	K3
CO3	Apply the knowledge of various methods to solve numerical integration problems	K3
CO4	Relate the mathematical thinking that is applicable to daily life	K3
CO5	Develop skills with core elements of MATLAB	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	3	2	2	2
CO2	3	3	3	2	2	2	3	2	2	3
CO3	2	2	2	2	2	2	2	2	2	2
CO4	2	3	2	3	2	3	2	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2

“1”–Slight(Low)Correlation–“2”–Moderate (Medium)Correlation–

“3”–Substantial(High) Correlation–“-”indicatesthereisnocorrelation.

LIST OF PROGRAMS

1. Birge-Vieta method
2. Bairstow's method.
3. Power Method
4. Horner's Method
5. Singular valued Decomposition
6. QR factorization
7. Characteristic Equation
8. Eigen values and Eigen vectors
9. Adams-Bashforth predictor corrector Method
10. Milne's predictor corrector Method
11. Errors of Newton Raphson Method
12. Lobatto IntegrationMethod

Web References

1. <https://www.mathworks.com/matlabcentral/fileexchange/21013-iterative-adaptive-simpson-and-lobatto-quadrature>
2. <https://www.mathworks.com/matlabcentral/answers/308414-newton-raphson-method-errors>
3. <https://www.mathworks.com/matlabcentral/answers/17931-bairstow-method-to-find-polynomial-roots-matlab-code->
4. <https://www.mathworks.com/matlabcentral/fileexchange/63034-adams-bashforth-moulton-method>
5. <https://www.mathworks.com/matlabcentral/fileexchange/99604-milne-s-method>

Pedagogy

Power point presentations and Assignment.

Course Designers

1. Dr.R.Radha

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with 'A' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

PG AND RESEARCH DEPARTMENT OF MATHEMATICS



**M. Sc. MATHEMATICS
AUTONOMOUS SYLLABUS
2022 – 2023 and onwards**

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

VISION

To strive for excellence in the mathematical sciences in addition to encourage people to undertake opportunities in transdisciplinary domains.

MISSION

- To enhance analytical and logical problem-solving capabilities.
- To provide excellent mathematical science knowledge for a suitable career and to groom students for national prominence.
- To teach students how to use data analytics.
- To prepare students for transdisciplinary research and applications.
- Value-based education and service-oriented training programmes are used to acquire life skills.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc MATHEMATICS

PO NO.	On completion of M.Sc Mathematics, the students will be able to
PO 1	Problem Analysis Provide opportunities to develop innovative design skills, including the ability to formulate problems, to think creatively, to synthesize information, and to communicate effectively.
PO 2	Scientific Skills Create and apply advanced techniques and tools to solve the societal environmental issues.
PO 3	Environment and Sustainability Ascertain eco-friendly approach for sustainable development and inculcate scientific temper in the society.
PO 4	Ethics Imbibe ethical and social values aiming towards holistic development of learners.
PO 5	Life long learning Instill critical thinking, communicative knowledge which potentially leads to higher rate of employment and also for higher educational studies.

PROGRAMME SPECIFIC OUTCOMES FOR M.Sc MATHEMATICS

PSO NO.	The Students of M.Sc Mathematics will be able to	POs Addressed
PSO1	Make a significant contribution to society's development through mathematical study	PO1 PO2 PO3
PSO2	Provide an in-depth and extensive functional understanding of mathematical basics.	PO1
PSO3	Develop the experimental abilities in order to solve scientific and technical problems.	PO1 PO5
PSO4	Promote the learners and explore the potential in emerging fields.	PO4 PO5
PSO5	Enhance problem-solving, thinking, and creative skills through assignments and project work.	PO4 PO5



Cauvery College for Women (Autonomous), Trichy-18
PG & Research Department of Mathematics
M.Sc Mathematics
Learning Outcome Based Curriculum Framework (CBCS-LOCF)

For the Candidates admitted from the Academic year 2022-2023 onwards

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course– I (CC)	Algebra-I	22PMA1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Ordinary Differential Equations	22PMA1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Integral Equations, Calculus of Variations and Transforms	22PMA1CC3	6	5	3	25	75	100
	Core Course - IV (CC)	Algebraic Number Theory	22PMA1CC4	6	5	3	25	75	100
	Discipline Specific Elective Course-I (DSE)	A. Advanced Numerical Analysis	22PMA1DSE1A	6	3	3	25	75	100
		B. Mathematical Modelling	22PMA1DSE1B						
		C. Boundary Value Problems	22PMA1DSE1C						
	Total				30	23	-	-	-

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
II	Core Course– V (CC)	Algebra-II	22PMA2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Real Analysis	22PMA2CC6	6	5	3	25	75	100
	Core Course -VII (CC)	Linear Algebra	22PMA2CC7	6	5	3	25	75	100
	Core Choice Course– I (CCC)	A. Partial Differential Equations	22PMA2CCC1A	6	4	3	25	75	100
		B. Mathematical Programming	22PMA2CCC1B						
		C. Difference Equations	22PMA2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A. Computational Mathematics Using MATLAB (P)	22PMA2DSE2AP	6	3	3	40	60	100
		B. Mathematical Modelling Using MATLAB (P)	22PMA2DSE2BP						
		C. Ordinary Differential Equations and Partial Differential Equations Using MATLAB (P)	22PMA2DSE2CP						
	Internship	Internship	22PMA2INT	-	2	-	-	100	100
Extra Credit Course	SWAYAM	As per UGC's Recommendation							
Total				30	24	-	-	-	600

15 Days INTERNSHIP during Semester Holidays

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int	Ext.	
III	Core Course– VIII(CC)	Topology	22PMA3CC8	6	5	3	25	75	100
	Core Course – IX (CC)	Discrete Mathematics	22PMA3CC9	6	5	3	25	75	100
	Core Course - X (CC)	Measure and Integration	22PMA3CC10	6	5	3	25	75	100
	Core Choice Course– II (CCC)	A. Cyber Security	22PGCS3CCC2A	3(T) + 2(P)	4	3	25	75	100
		B. Introduction to Coding Theory	22PMA3CCC2B	5					
		C. Mechanics	22PMA3CCC2C						
	Discipline Specific Elective Course-III (DSE)	A. Analytical Skills for Competitive Examinations	22PMA3DSE3A	4	3	2	-	100	100
		B. Stochastic Processes	22PMA3DSE3B			3	25	75	
		C. Fuzzy Sets and their Applications	22PMA3DSE3C						
	Generic Elective Course-I (GEC)	Foundation for Logical Thinking	22PMA3GEC1	3	2	3	25	75	100
	Extra Credit Course	SWAYAM	As per UGC Recommendation						
	Total				30	24	-	-	-

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
IV	Core Course–XI(CC)	Complex Analysis	22PMA4CC11	6	5	3	25	75	100
	Core Course - XII(CC)	Functional Analysis	22PMA4CC12	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. Differential Geometry	22PMA4CCC3A	6	4	3	25	75	100
		B. Formal Language and Automata Theory	22PMA4CCC3B						
		C. Fluid Dynamics	22PMA4CCC3C						
	Generic Elective Course-II (GEC)	Optimization Techniques	22PMA4GEC2	3	2	3	25	75	100
	Project	Project Work	22PMA4PW	9	5	-	-	100	100
	Total			30	21	-	-	-	500
	Grand Total			120	92	-	-	-	2200

Courses & Credits for PG and Research Department of Mathematics

S. No	Courses	No. of Courses	No. of Credits	Marks
1.	Core Course– (CC)	12	60	1200
2.	Core Choice Course– (CCC)	3	12	300
3.	Discipline Specific Elective- (DSE)	3	9	300
4.	Generic Elective Course - (GEC)	2	4	200
5.	Project	1	5	100
6.	Internship	1	2	100
	Total	22	92	2200

Students will go for internship after completing the I Semester exams and the internship will be calculated in the II Semester and credits for internship is 02.

For each semester marks will be for 500(600 for II Semester due to internship)

The internal and external marks for theory and practical papers are as follows:

Subject	Internal	External
Theory	25	75
Practical	40	60

Separate passing minimum is prescribed for Internal and External

For Theory:

- The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks).
- The passing minimum for End Semester Examination shall be 40% out of 75 marks (i.e. 30 marks).
- The passing minimum not less than 50% in the aggregate.

For Practical:

- The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e. 24 marks)
- The passing minimum not less than 50% in the aggregate.

For Project:

Project : 100 Marks
Dissertation : 80 Marks
Viva Voce : 20 Marks

Semester IV	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PMA4CC11	COMPLEX ANALYSIS	CORE	6	5

Course Objective

- **Define** analytic functions, linear transformations, Harmonic functions and power series.
- **Explore** the fundamental concepts of Cauchy's theorem, Cauchy's integral formula and the calculus of residues.
- **Apply** the idea of removable singularities, zeros and poles in various fields.

Prerequisite

Fundamental concepts in Real Analysis

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the fundamental concepts of conformality, Analytic functions, complex integration and series.	K2
CO2	Apply the various concepts of complex integration in different fields.	K3
CO3	Ascertain the notion of complex integration, series, conformality and linear transformations.	K4
CO4	Evaluate the problems in complex integration using various concepts.	K5
CO5	Develop the basic concepts of complex integration, conformality, series in various fields.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	2	3	3
CO2	3	3	3	3	3	2	3	3	2	3
CO3	3	3	3	3	3	2	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Conformality and Linear Transformations: Arcs and closed curves – Analytic Functions in Regions – Conformal Mapping – Length and Area – The Linear Group – The Cross Ratio – Symmetry.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
II	Fundamental Theorems and Cauchy's Integral Formula: Line Integrals – Rectifiable Arcs – Line Integrals as Functions of Arcs – Cauchy's Theorem for a Rectangle – Cauchy's Theorem in a Disk – The Index of a Point with Respect to a Closed Curve – The Integral Formula – Higher Derivatives.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
III	Local Properties of Analytical Functions: Removable Singularities. Taylor's Theorem – Zeros and Poles – The Local Mapping – The Maximum Principle.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
IV	The General Form of Cauchy's Theorem and The Calculus of Residues: Chains and Cycles – Simple Connectivity – Homology – The General Statement of Cauchy's Theorem – Proof of Cauchy's Theorem – Locally Exact Differentials – The Residue Theorem – The Argument Principle – Evaluation of Definite Integrals.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
V	Harmonic Functions and Power Series Expansions: Definition and Basic Properties – The Mean-value Property – Poisson's Formula – Schwarz's Theorem – The Reflection Principle – Weierstrass's Theorem – The Taylor Series – The Laurent Series.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Elementary Point Set Topology – Oriented Circles – Families of Circles - Multiply Connected Regions.	-	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6

Text Book

Lars V. Ahlfors. (1979). *Complex Analysis* (Third Edition). McGraw-Hill International Editions.

Chapters and Sections

UNIT-I	Chapter 3: Sections 2.1 – 2.4, 3.1 – 3.3
UNIT-II	Chapter 4: Sections 1.1 – 1.5, 2.1 – 2.3
UNIT-III	Chapter 4: Sections 3.1 – 3.4
UNIT- IV	Chapter 4: Sections 4.1 – 4.6, 5.1 – 5.3
UNIT- V	Chapter 4: Sections 6.1 – 6.5 Chapter 5: Sections 1.1 – 1.3

Reference Books

1. Serge Lang. (2005). *Complex Analysis* (Fourth Edition, First Indian Reprint). Springer International Edition.
2. Ponnusamy S. (2007). *Foundations of Complex Analysis* (Second Edition, First Reprint). Narosa Publishing House Pvt. Ltd.
3. John B. Conway. (2002). *Functions of One Complex Variable* (Second Edition, Sixteenth Reprint). Narosa Publishing House.

Web References

1. <https://youtu.be/3rQjKI9G8TO>
2. <https://tinyurl.com/45me9mx6>
3. <https://tinyurl.com/yrmka7d9>
4. <https://youtu.be/OCnFnBtlg-c>
5. <https://tinyurl.com/3mthbnsp>
6. <https://tinyurl.com/52y5mmpw>
7. <https://tinyurl.com/58p5c888>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. S. Vidhya

Semester IV	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PMA4CC12	FUNCTIONAL ANALYSIS	CORE COURSE	6	5

Course Objectives

- **Explore** Banach spaces, Hilbert spaces and their properties.
- **Compose** clear, accurate proof of Hahn Banach Theorem, Open Mapping Theorem using continuous linear transformation and Conjugate of an operator.
- **Analyze** the structure of Commutative Banach Algebras to prove the Gelfand Neumark theorem.

Prerequisite

Topology and Linear algebra at PG level.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain Banach spaces, Hilbert spaces, Banach algebras, commutative banach algebra and interpret their properties with other type of spaces.	K2
CO2	Apply the analytical techniques and theoretical knowledge in Banach spaces, Hilbert spaces, Banach algebras, commutative banach algebras.	K3
CO3	Construct banach algebras, Commutative banach algebra through banach spaces and determine orthonormal sets in Hilbert spaces.	K4
CO4	Analyze the properties of the operators defined on these spaces.	K4
CO5	Attain knowledge and experience of working with many pure mathematical problems.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	2	3	2	2	2	3	2	2	2	3
CO4	2	2	2	2	2	3	2	2	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	BANACH SPACES The definition and some examples – Continuous linear transformations – The Hahn-Banach theorem – The natural imbedding of N in N^{**} – The open mapping theorem – The conjugate of an operator.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
II	HILBERT SPACES The definition and some simple properties – Orthogonal complements – Orthonormal sets – The conjugate space H^* .	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
III	HILBERT SPACES The adjoint of an operator – Self-adjoint operators – Normal and unitary operators – Projections.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
IV	GENERAL PRELIMINARIES ON BANACH ALGEBRAS The definition and some examples – Regular and singular elements – Topological divisors of zero – The spectrum – The formula for the spectral radius – The radical and semi-simplicity.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
V	THE STRUCTURE OF COMMUTATIVE BANACH ALGEBRAS The Gelfand mapping – Applications of the formula $r(x) = \lim \ x^n\ ^{1/n}$ – Involutions in Banach Algebras – The Gelfand-Neumark theorem.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Euclidean and unitary spaces – Weak topologies – Linear spaces – Determinants and the spectrum of an operator – Commutative C^* -algebras.	-	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5

Text Book

George F. Simmons (2016). *Introduction to Topology and Modern Analysis* (26th reprint). McGraw Hill Education (India) Private Limited, New Delhi.

Chapters and Sections

UNIT-I	Chapter 9	Sections 46 – 51
UNIT-II	Chapter 10	Sections 52 – 55
UNIT-III	Chapter 10	Sections 56 – 59
UNIT- IV	Chapter 12	Sections 64 – 69
UNIT- V	Chapter 13	Sections 70 – 73

Reference Books

1. Walter Rudin (2008). *Functional Analysis (Fourth Reprint)*. Tata Mcgraw-Hill Publishing Company Limited, New Delhi.
2. B.V. Limaye (2002). *Functional Analysis (Second Edition)*. New Age International (P) Limited Publishers, New Delhi.
3. K.Yosida (2005). *Functional Analysis (Second Indian Reprint)*. Springer-Verlag, Newyork.

Web References

1. <https://youtu.be/imYQJOgUx7Y>
2. <https://youtu.be/EGii1z7XHA>
3. <https://youtu.be/MfZz1k9rUc>
4. <https://youtu.be/0LnL9kE-6us>
5. <https://youtu.be/zOPEABKzBpc>
6. https://youtu.be/kiUTXw3_jds
7. <https://59clc.files.wordpress.com/2012/08/functional-analysis--rudin-2th.pdf>
8. <https://people.math.ethz.ch/~salamon/PREPRINTS/funcana.pdf>
9. <https://zlib.pub/book/introduction-to-topology-and-modern-analysis-7jh9srua6920>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. C.Saranya

Semester III	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22PMA4CCC3A	DIFFERENTIAL GEOMETRY	CORE CHOICE COURSE	6	4

Course Objectives

- **Introduce** space curves and its characterizations.
- **Study** properties of curves on surfaces.
- **Understand** the concepts of Geodesics and canonical Geodesics equations.

Prerequisite

Knowledge of basic concepts of Vectors and Differentiation.

Course Outcomes

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand the concepts of a space curve, Geodesics, developables, helioids and umbilics.	K2
CO2	Compute its curvature and torsion, surface of revolution, Existence theorems and lines of curvature.	K2
CO3	Acquire the knowledge of curves on a surface, Geodesic curvature and lines of curvature	K3
CO4	Determine the second fundamental form and developable associated with curves on surfaces, Hilbert's Lemma and classify differential geometry of several surfaces.	K3
CO5	Interpret the concepts of geodesics and its normal properties, differential geometry of surfaces and also familiar with Gauss Bonnet Theorem.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	2	3	1	3	3	1	2
CO2	3	3	2	1	3	1	3	3	2	2
CO3	3	3	2	2	3	1	3	3	2	2
CO4	3	3	2	2	3	1	3	3	2	2
CO5	3	3	2	2	3	1	3	3	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	The Theory of Space Curves Definitions – Arc length – Tangent, normal and binormal – Curvature and torsion of a curve given as the intersection of two surfaces – Contact between curves and surfaces – Tangent surface, involutes and evolutes – Helices.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	The Metric Definition of a surface – Curves on a surface – Surfaces of revolution – Helicoids – Metric – Direction coefficients – Families of curves – Isometric correspondence.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Geodesics Geodesics – Canonical geodesic equations – Normal property of geodesics – Existence theorems – Geodesic parallels – Geodesic curvature – Gauss-Bonnet Theorem	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	The Second Fundamental Form: Local Non-Intrinsic Properties of a Surface The Second fundamental form – Principal curvatures – Lines of curvature – Developables –	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	Developables associated with space curves.			
V	Differential Geometry of surfaces in the large Compact surfaces whose points are umbilics – Hilbert’s Lemma – Compact surfaces of constant Gaussian or mean curvature – Complete surfaces.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment: (Not included for End Semester Examinations) Intrinsic equations, fundamental existence theorem for space curves – Intrinsic properties - Gaussian curvature – Surfaces of constant curvature - Developables associated with curves on surfaces- Characterization of complete surfaces.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

T.J. Willmore (2017), *An Introduction to Differential Geometry* (21st Impression), Oxford University Press, New Delhi.

Chapters and Sections

UNIT-I	Chapter I:	Sections: 2 - 7 & 9
UNIT-II	Chapter II:	Sections: 1 - 8
UNIT-III	Chapter II:	Sections: 10 - 16
UNIT- IV	Chapter III:	Sections: 1 - 5
UNIT- V	Chapter IV:	Sections: 2 - 5

Reference Books

1. D. Somasundaram (2010), *Differential Geometry*, A First Course (Third Reprint), Narosa Publishing House, New Delhi.
2. Christian Bar (2011), *Elementary Differential Geometry* (First South Asian Edition), Cambridge University Press, New York.
3. J.A. Thorpe (2004), *Elementary Topics in Differential Geometry* (First Indian Reprint), , Springer-Verlag, New York.

Web References

1. <https://www.youtube.com/watch?v=4fB0VfKZRXM>
2. <https://youtu.be/1HUpNAS81PY?list=PLIljB45xT85DWUiFYYGqJVtfnkUFWkKtP>
3. <https://youtu.be/J-RgiQca6Q8?list=PLIljB45xT85DWUiFYYGqJVtfnkUFWkKtP>
4. <https://youtu.be/drOldszOT7I?list=PLIljB45xT85DWUiFYYGqJVtfnkUFWkKtP>
5. <https://youtu.be/QXrqs5zD2I>
6. <https://youtu.be/zADj0k0waFY>
7. <https://people.math.ethz.ch/~salamon/PREPRINTS/diffgeo.pdf>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz and Assignment.

Course Designer

Ms. A. Gowri Shankari

Semester IV	Internal Marks: 25		External Marks: 75	
COURSECODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PMA4CCC3B	FORMAL LANGUAGE AND AUTOMATA THEORY	CORE CHOICE COURSE – III	6	4

Course Objectives

- **Explore** the nuances of Automata and Grammar.
- **Analyze** the applications of these techniques in Computer science.
- **Apply** the ideas for constructing the Regular Expressions.

Prerequisite

Familiarity in concepts of Discrete Mathematics.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the basic concepts of automata, regular expressions, regular sets, grammars and compilers.	K2
CO2	Interpret the fundamental ideas in formal languages, automata, compilers and regular sets.	K2
CO3	Relate the concepts of deterministic and nondeterministic Finite Automata, grammars, regular expressions with pushdown automata, compilers and regular sets.	K3
CO4	Determine the implementation of automata languages, regular expressions, regular sets in compilers.	K4
CO5	Deduce mathematical notions in computability of regular expressions, automata, grammars, and regular sets and compilers.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	2	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation –

“2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	FINITE AUTOMATA: Finite state systems – Basic definitions – Nondeterministic finite automata – Finite automata with ε – moves.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
II	REGULAR EXPRESSIONS AND CONTEXT-FREE GRAMMARS: Regular expressions - Motivation and introduction – Context-free grammars – Derivation trees – Chomsky normal form – Greibach normal form.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
III	PROPERTIES OF REGULAR SETS: The pumping lemma for regular sets - Closure properties of regular sets - Decision algorithms for regular sets - The Myhill-Nerode theorem and minimization of finite automata.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
IV	PUSHDOWN AUTOMATA: Informal description - Definitions - Pushdown automata and context-free languages.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
V	INTRODUCTION TO COMPILERS: Compilers and translators – Why we need translators? - The structure of compiler - Lexical analysis - Syntax analysis - Intermediate code generation – Optimization - Code generation - Book keeping - Error handling - Compiler writing tools - Getting Started.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Strings, alphabets and languages - Graphs and trees - Applications of finite automata – From regular expression to finite automata - Minimizing the number of states of a DFA.	-	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5

Text Books

1. John E. Hopcroft and Jeffery D. Ullman (1979), *Introduction to Automata theory, Languages and Computation*, Narosa Publishing House Pvt. Ltd
2. Alfred V. Aho and Jeffrey D. Ullman, (2002), *Principles of Compiler Design (Twentyfifth Reprint)*, Narosa Publishing House.

Chapters and Sections

UNIT-I	Chapter 2[1]: Sections 2.1 - 2.4
UNIT-II	Chapter 2[1]: Sections 2.5 Chapter 4[1]: Sections 4.1 - 4.3, 4.5, 4.6
UNIT-III	Chapter 3[1]: Sections 3.1 – 3.4
UNIT-IV	Chapter 5[1]: Sections 5.1 – 5.3
UNIT-V	Chapter 1[2]: Sections 1.1 – 1.12

Reference Books

1. Iyengar N Ch S. N., Chandrasekaran V.M, Venkatesh K. A, Arunachalam P.S.(2005), *Discrete Mathematics(Third Reprint)*, Vikas Publishing House Pvt Ltd.
2. Dhamdhere (2008),*Compiler Construction,(Reprint five time)*, Macmillan India Ltd.
3. Alfred V. Aho Ravi Sethi Jeffrey D. Ullman (2007), *Compilers Principles, Techniques, and Tools*, Pearson Education.

Web References

1. https://www.vssut.ac.in/lecture_notes/lecture1423726104.pdf
2. <https://www.iitg.ac.in/dgoswami/Flat-Notes.pdf>
3. https://www.youtube.com/watch?v=ntrF_KxHn18&pp=ygUacHVzaGRvd24gYXV0b21hdGEgZXhhbXBsZXNM%3D
4. <https://www.youtube.com/watch?v=4nx8LEGy9kI&pp=ygUlVG4aWNhbCBhbmFseXNpcyBkZWZpbml0aW9uICBleGFtcGxlcmw%3D%3D>
5. <https://www.youtube.com/watch?v=H0Mf4FE2wiU&pp=ygUoUmVndWxhciBFeHBzZXNzaW9ucyBkZWZpbml0aW9uICBleGFtcGxlcmw%3D%3D>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. S. Saridha

Semester IV	Internal Marks: 25		External Marks: 75	
COURSECODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PMA4CCC3C	FLUID DYNAMICS	CORE CHOICE COURSE	6	4

Course Objectives

- **Understand** the dynamics of real fluids.
- **Familiarize** with the properties of fluids and the applications of fluid dynamics.
- **Apply** the concept of fluid measurement, types of flows and dimensional analysis.

Prerequisite

Basic concepts in Dynamics.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Understand the measuring techniques of temperature, heat flux, pressure, velocity, force and flow rate.	K2
CO2	Apply governing equations for particular flow fields with applications and analyse potential flows and execute concept of conformal transformation for flow over bodies.	K3
CO3	Compute the Navier - Stokes equations of Motion of a Viscous Fluid and analyse the Kinematics of fluids, two dimensional and three-dimensional flows through various techniques	K3
CO4	Examine viscous flows through various systems and apply various intrusive and non-intrusive techniques to measure flow and fluid properties.	K4
CO5	Evaluate the knowledge of experimental fluid dynamics and analyze of fluid motion.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	2	3	3	3	2	2	3
CO2	3	3	2	1	3	3	3	2	3	2
CO3	3	3	2	2	3	2	3	2	3	2
CO4	3	3	2	2	3	2	2	3	3	3
CO5	3	3	2	2	3	3	3	3	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Kinematics of Fluids in Motion: Real Fluids and Ideal Fluids – Velocity of a Fluid at a point – Streamlines and Path lines; Steady and Unsteady Flows – The Velocity potential – The Vorticity vector – Local and Particle Rates of Change – The Equation of continuity – Worked examples – Acceleration of a Fluid – Conditions at a rigid boundary Equations of Motion of a Fluid: Pressure at a point in a Fluid at Rest – Pressure at a point in a Moving Fluid – Conditions at a Boundary of Two Inviscid Immiscible Fluids – Euler’s equations of motion – Bernoulli’s equation – Worked examples.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Equations of Motion of a Fluid: Discussion of the case of steady motion under conservative body forces – Some potential theorems – Some Flows Involving Axial Symmetry – Some special two-Dimensional Flows – Impulsive Motion Some Three-Dimensional Flows: Sources, Sinks and Doublets – Images in a Rigid Infinite Plane – Images in solid spheres – Axi-Symmetric Flows; Stokes’s stream function.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Some Two-Dimensional Flows: Meaning of a Two-Dimensional Flow – Use of cylindrical Polar coordinates – The stream function – The Complex Potential for Two-Dimensional, Irrotational, Incompressible Flow – Complex velocity potentials for Standard Two-Dimensional Flows – Some worked examples – Two-Dimensional Image systems – The Milne-Thomson circle theorem – The Theorem of Blasius.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Some Two-Dimensional Flows: The use of conformal Transformation – The Schwarz-Christoffel Transformation	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	Viscous Flow: Stress components in a Real fluid – Relations between Cartesian components of stress – Translational Motion of Fluid Element – The Rate of Strain Quadric and Principal Stresses – Some Further properties of the Rate of Strain Quadric – Stress Analysis in Fluid Motion – Relations Between stress and rate of strain – The coefficient of viscosity and Laminar Flow			
V	Viscous Flow: Some solvable problems in Viscous Flow – Steady Viscous Flow in Tubes of Uniform cross section – Diffusion of Vorticity – Energy Dissipation due to Viscosity – Steady Flow past a Fixed Sphere Dimensional Analysis; Reynolds Number.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment: (Not included for End Semester Examinations) General analysis of fluid motion –Some Further Aspects of Vortex Motion - Some Special Forms of the Stream Function for Axi-Symmetric Irrotational Motions – Vortex Rows - – The Navier-Stokes equations of Motion of a Viscous Fluid - Prandtl's Boundary Layer.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

F. Chorlton (2004), *Text Book of Fluid Dynamics*, CBS Publishers & Distributors Pvt. Ltd., New Delhi.

Chapters and Sections

UNIT-I	Chapter 2:	Sections 2.1 - 2.10
	Chapter 3:	Sections 3.1 - 3.6
UNIT-II	Chapter 3:	Sections 3.7 - 3.11
	Chapter 4:	Sections 4.2 - 4.5 (omit 4.5.1)
UNIT-III	Chapter 5:	Sections 5.1 – 5.9
UNIT-IV	Chapter 5:	Sections 5.10 – 5.11
	Chapter 8:	Sections 8.1 – 8.8
UNIT-V	Chapter 8:	Sections 8.10 – 8.15

Reference Books

- [1] Dr. M.D. Raisinghania (2013), *Fluid Dynamics with Complete Hydrodynamics and Boundary Layer Theory*, S. Chand & Company Pvt. Ltd. (Online PDF)
- [2] Hyoungh Woo Oh (2012), *Advanced Fluid Dynamics*. (Online PDF)
- [3] J.H. Ferziger & M. Peric (2005), *Computational methods for fluid Dynamics* (Third Edition), Springer – Verlag.

Web References

1. <https://www.youtube.com/watch?v=zzdWqBnwkys>
2. <https://tinyurl.com/yunrr3eb>
3. <https://www.youtube.com/watch?v=I4NZANfyzMs&list=PL1UZBJqzzy--IKFA0xRcsgVsdqctF2r2p&index=2>
4. <https://tinyurl.com/bdf2bwv3>
5. <https://www.youtube.com/watch?v=wIPXZrP9vR8&list=PLCoE5wxWtHFYiVGswvsWRaHjv18vxZzE2>
6. file:///C:/Users/user/Downloads/toaz.info-fluid-dynamics-by-chorlton-pr_5ce01488c289a4a10ce5d30a8198cc16.pdf

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. G. Janaki

Semester IV	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PMA4GEC2	OPTIMIZATION TECHNIQUES	GENERIC ELECTIVE	3	2

Course Objectives

- **Understand** the various features of Operations research.
- **Analyze** the optimum solutions using Operations research.
- **Explore** the concepts of Operations research in real life problems.

Prerequisite

Basic computational knowledge.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Illustrate the various notions in the respective streams.	K2
CO2	Identify the different terminologies of Operations research	K3
CO3	Analyze the solutions of mathematical problem using specific techniques.	K4
CO4	Simplify the optimum solutions of a mathematical problem.	K5
CO5	Construct various mathematical problem of Sequencing.	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	2	3	3	3	2	3
CO2	3	2	3	3	2	3	3	3	3	2
CO3	3	2	3	3	2	3	2	3	2	2
CO4	3	2	2	2	2	3	3	2	3	2
CO5	3	2	3	2	2	3	3	3	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Linear Programming Problem – Mathematical Formulation Introduction - Linear Programming Problem - Mathematical Formulation of the Problem - Illustration on Mathematical Formulation of LPPs. Linear Programming Problem – Graphical Solution and Extension Introduction - Graphical Solution Method - Some Exceptional Cases	9	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
II	Linear Programming Problem – Graphical Solution and Extension General Linear Programming Problem - Canonical and Standard Forms of LPP. Linear Programming Problem – Simplex Method Introduction - Fundamental Properties of Solutions - The computational Procedure.	9	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
III	Transportation Problem: The Transportation Table – Solution of a Transportation Problem - Finding an initial basic feasible solution - Transportation algorithm (MODI method) - Some exceptional Cases.	9	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
IV	Assignment Problem: Introduction - Solution methods of assignment problem – Special Cases in Assignment Problem.	9	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
V	Sequencing Problem: Introduction – Problem of Sequencing – Basic Terms Used in Sequencing – Processing n Jobs through Two Machines – Processing n Jobs through k Machines.	9	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Some Exceptional Cases (Graphical Solution) - Use of Artificial Variables – Degeneracy in Transportation Problem – The Traveling Salesman Problem - Processing 2 Jobs through k Machines.	-	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6

Text Book

Kanti Swarup, P.K. Gupta, Manmohan. (2008). *Operations research*, Sultan Chand & sons

Chapters and Sections

UNIT-I	Chapter 2: Sections 2.1 – 2.4 Chapter 3: Sections 3.1 - 3.3.
UNIT-II	Chapter 3: Sections 3.4 - 3.5. Chapter 4: Sections 4.1 – 4.3
UNIT- III	Chapter 10: Sections 10.5, 10.8, 10.9, 10.13, 10.15.
UNIT- IV	Chapter 11: Sections 11.1, 11.3, 11.4
UNIT- V	Chapter 12: Sections 12.1 – 12.5.

Reference Books

1. Hamdy A.Taha. (2017). *Operations Research An Introduction* Pearson India Education services PVT Ltd
2. Premkumar Gupta. (2004). *Operations Research*. S.Chand & Company Ltd, New Delhi..
3. Chandrasekhara Rao.K,Shanti Lata Mishra. (2008). *Real Operations Research*, Narosa Publishing House PVT Ltd, New Delhi

Web References

1. <https://youtube.com/@introductiontooperationsre4975?si=s4hUaj5nLi331rrz>
2. <https://youtube.com/@iit?si=X62o-o3CvMdgXQpg>
3. <https://youtube.com/@introductiontooperationsre4975?si=s4hUaj5nLi331rrz>
4. <https://youtube.com/@iit?si=X62o-o3CvMdgXQpg>
5. https://youtube.com/@kauserwise?si=tdP_lvoCD12LgHos

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. E. Litta.

ANNEXURE H

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (III CYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI – 620 018

PG AND RESEARCH DEPARTMENT OF PHYSICS



B.Sc., PHYSICS SYLLABUS

(2023-2024 and Onwards)

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
TIRUCHIRAPPALLI-620 018

PG AND RESEARCH DEPARTMENT OF PHYSICS

VISION

To establish a substratum for excellence and creation of knowledge by igniting the essence of learning physics and exploring its area of research with novel ideas.

MISSION

Our mission is two – fold.

- To provide an outstanding and distinctive education to our undergraduate and postgraduate students.
- To expand our research enterprises via centers and institutes to achieve national and international prominence in strategic research areas.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc PHYSICS PROGRAMME

PO NO.	On completion of B.Sc Physics Programme, The students will be able to
PO 1	Domain Knowledge: Analyse, design and develop solutions by applying firm fundamental concepts of basic sciences and expertise in discipline.
PO 2	Problem solving: Ability to think rationally, analyse and solve problems adequately with practical knowledge to assess the environmental issues.
PO 3	Creative thinking and Team Work: Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO 4	Employability: Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO 5	Life Long Learning: Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc PHYSICS PROGRAMME

B.Sc PHYSICS CURRICULUM [2023-2024 and Onwards]

PSO NO.	Programme Specific Outcomes Students of B.Sc Physics will be able to	POs Addressed
PSO1	Intensify the student academic capability, unique qualities and transferable skills which will give them opportunity to evolve as responsible citizens.	PO1, PO2, PO4
PSO2	Explain the fundamentals laws involved in physics.	PO1, PO5
PSO3	Understand the theory and consequence of the various physical occurrence.	PO1, PO2, PO3, PO5
PSO4	Carryout experiments to interpret the laws and concepts of Physics.	PO1, PO2, PO5
PSO5	Relate the theories learnt and the skills procured to solve enduring problems.	PO1, PO2, PO3, PO5



Cauvery College for Women (Autonomous)

PG & Research Department of Physics

B.Sc., Physics

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2023-2024 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC)	பொதுத்தமிழ் – I	23ULT1	6	3	3	25	75	100
			Hindi ka Samanya Gyan aur Nibandh	23ULH1						
			Poetry, Grammar and History of Sanskrit Literature	23ULS1						
			Foundation Course: Paper I- French I	23ULF1						
	II	English Language Course- I(ELC)	General English -I	23UE1	6	3	3	25	75	100
	III	Core Course – I(CC)	Properties of Matter and Acoustics	23UPH1CC1	5	5	3	25	75	100
		Core Practical - I (CP)	Properties of Matter and Acoustics (P)	23UPH1CC1P	3	3	3	40	60	100
		First Allied Course- I (AC)	Calculus and Fourier Series	22UPH1AC1	4	3	3	25	75	100
		First Allied Course- II (AC)	Algebra, Analytical Geometry of 3D & Trigonometry	22UPH1AC2	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	Value Education	23UGVE	2	2	-	100	-	100
	Total				30	22				700
II	I	Language Course-II (LC)	பொதுத்தமிழ் – II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar –II	22ULH2						
			Prose, Grammar and History of Sanskrit Literature	23ULS2						
			Basic French - II	22ULF2						
	II	English Language Course- II(ELC)	General English - II	23UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Mechanics and Relativity	22UPH2CC2	5	5	3	25	75	100
		Core Practical - II (CP)	Mechanics and Digital Electronics (P)	22UPH2CC2P	3	3	3	40	60	100
		Core Course -III (CC)	Introduction to Digital Electronics	23UPH2CC3	2	2	3	25	75	100
		First Allied Course –III (AC)	ODE, PDE, Laplace Transforms and Vector Analysis	22UPH2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Ability Enhancement Compulsory Course- III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
	Extra Credit Course		SWAYAM		As per UGC Recommendation					
	Total					30	22			

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23UPH2CC3	INTRODUCTION TO DIGITAL ELECTRONICS	CC-III	2	2

Course Objectives

- To learn about different numbers systems and their conversion from one to another.
- To understand the workings of logic gates and equations.
- To acquire Knowledge about Boolean laws to draw Karnaugh maps.
- To know the uses of encoders, decoders, multiplexers and demultiplexers.
- To understand the workings of flip-flops and to analyze sequential circuits.

Pre-requisites

- Basic knowledge of the binary number system.
- Fundamental ideas on logic gates.
- Basic knowledge of the conversion of a number system.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to	Cognitive Level
CO 1	Understand the basic knowledge of Number system, Logic gates, Combinational circuit, Boolean expression and Flip flops	K1
CO 2	Interpret the concept of number conversion, logic circuits and thereby develop equivalent circuits.	K2
CO 3	Develop the concept of number conversion and combinational logic circuits.	K3
CO 4	Examine different number system, arithmetic and logic functions with appropriate selection of inputs and check the possible outputs for arithmetic and logic circuits.	K4
CO 5	Simplify the arithmetic operation of the number system. Apply the Boolean expressions in the K Map and design the flip flop.	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	2	2	3	3	2	2	2
CO 2	2	2	2	2	2	3	3	2	3	3
CO 3	2	3	3	2	2	3	3	3	3	3
CO 4	2	2	3	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” – indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	NUMBER SYSTEM AND CODE: Binary number system – Binary to decimal conversion – Decimal to binary conversion – Octal numbers – Conversion of octal numbers – Hexadecimal numbers – Conversion of hexadecimal numbers.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	ARITHMETIC CIRCUITS: Binary addition – Binary subtraction – Binary multiplication – Binary Division – Half and Full adder – Half and Full subtractor.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	DIGITAL LOGIC AND LOGIC CIRCUITS: Basic gates – NOT, OR, AND – EX-OR gates – Universal logic gates – NOR, NAND – Boolean laws – Simplification of Boolean Expression and Demorgan's theorems.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	APPLICATION OF BOOLEAN THEOREM – K-MAP: Sum-of-Products- Product of sum – Truth table to Karnaugh map – Pairs, Quads, and Octets – Karnaugh map simplifications – Don't care condition.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	FLIP – FLOPS: R-S flip-flops – Clocked R-S flip-flop – Edge-triggered RS flip flop – J-K flip – D flip-flop – T flip flop – Applications of flip-flops.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Application of number system Physical Quantity – Counting – Electrical project circuit.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Donald P Leach, Albert Paul Malvino, Goutam Saha, (2011). *Digital Principles and Applications*. (7th edition) Tata McGraw – Hill Publishing Company Limited, New Delhi.
2. Jain, R.P, (2009). *Modern Digital Electronics*. (4th edition) Tata McGraw Hill Education Private Limited, Noida.
3. Vijayendran, V, (2003). *Digital fundamentals*. (1st edition) S. Viswanathan Printers and Publishers Pvt. Ltd, Chennai.
4. Virendra Kumar, (2007). *Digital electronics Theory and Experiments*. (2nd edition) New Age International Publishers, Chennai.

Reference Books

1. James W. Bignel, (2007). *Digital Electronics*. (5th edition) Cengage learnings, Uttar Pradesh.
2. Mandal S.K, (2017). *Digital Electronics Principles & Applications*. (1st edition) McGraw Hill Education, Karnataka.
3. Thomas L. Floyd, (2015). *Digital Fundamentals*. (11th edition) Pearson Education, Bengaluru.
4. Kothari, D.P., J.S. Dhillon, (2016). *Digital Circuits and Design*. (1st edition) Pearson Education, Bengaluru.

Web References

1. <https://circuitglobe.com/rs-flip-flop.html>
2. <http://hyperPhysics.phy-astr.gsu.edu/hbase/Electronic/jkflipflop.html>
3. <https://circuitglobe.com/half-adder-and-full-adder-circuit.html>
4. <https://programmerbay.com/construct-4-to-1-multiplexer-using-logic-gates/>
5. <https://www.electronicshub.org/demultiplexerdemux/>
6. <https://www.elprocus.com/designing-of-2-to-4-line-decoder/>
7. <https://www.electricaltechnology.org/2018/05/bcd-to-7-segment-display-decoder.html>

Pedagogy

Chalk and Talk, Assignment, Group discussion and quiz

Course Designer

Dr.S.Priya

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (III CYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI – 18

PG AND RESEARCH DEPARTMENT OF PHYSICS



B.Sc., PHYSICS SYLLABUS

(2022-2023 Onwards)

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18.
PG AND RESEARCH DEPARTMENT OF PHYSICS

VISION

To establish a substratum for excellence and creation of knowledge by igniting the essence of learning physics and exploring its area of research with novel ideas.

MISSION

Our mission is two – fold.

- To provide an outstanding and distinctive education to our undergraduate and postgraduate students.
- To expand our research enterprises via centers and institutes to achieve national and international prominence in strategic research areas.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc PHYSICS PROGRAMME

PO NO.	Programme Outcome On completion of B.Sc Physics Programme, The students will be able to
PO 1	Domain Knowledge: Analyse, design and develop solutions by applying firm fundamental concepts of basic sciences and expertise in discipline.
PO 2	Problem solving: Ability to think rationally, analyse and solve problems adequately with practical knowledge to assess the environmental issues.
PO 3	Creative thinking and Team Work: Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO 4	Employability: Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO 5	Life Long Learning: Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc PHYSICS PROGRAMME

B.Sc PHYSICS CURRICULUM [2022-2023 Onwards]

PSO NO.	Programme Specific Outcomes Students of B.Sc Physics will be able to	POs Addressed
PSO1	Intensify the student academic capability, unique qualities and transferable skills which will give them opportunity to evolve as responsible citizens.	PO1, PO2, PO4
PSO2	Explain the fundamentals laws involved in physics.	PO1, PO5
PSO3	Understand the theory and consequence of the various physical occurrence.	PO1,PO2,PO3,PO5
PSO4	Carryout experiments to interpret the laws and concepts of Physics.	PO1,PO2,PO5
PSO5	Relate the theories learnt and the skills procured to solve enduring problems.	PO1,PO2,PO3,PO5



Cauvery College for Women (Autonomous)

PG & Research Department of Physics

B.Sc., Physics

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
IV	I	Language Course - IV (LC)	பண்டைய இலக்கியமும் உரைநடையும்	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French -II	22ULF4						
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature – II	22UE4	6	3	3	25	75	100
	III	Core Course – V (CC)	Electricity, Magnetism and Electromagnetism	22UPH4CC5	6	6	3	25	75	100
		Core Practical – IV (CP)	Electricity and Magnetism (P)	22UPH4CC4P	4	4	3	40	60	100
		Second Allied Course- III (AC)	Chemistry – II	22UPH4AC6	4	3	3	25	75	100
		Internship	Internship	22UPH4INT	-	2	-	25	75	100
	IV	Generic Elective Course- II (GEC)	Photography and Videography	22UPH4GEC2	2	2	3	25	75	100
			Basic Tamil – II	22ULC4BT2						
			Special Tamil – II	22ULC4ST2						
		Skill Enhancement Course – I (SEC)	Web Designing (P)	22UPH4SEC1P	2	2	3	40	60	100
Extra Credit Course		SWAYAM		As per UGC Recommendation						
Total					30	25				800
V	III	Core Course – VI (CC)	Optics	22UPH5CC6	6	6	3	25	75	100
		Core Practical – V (CP)	General and Electronics (P)	22UPH5CC5P	3	3	3	40	60	100
		Core Course – VII (CC)	Atomic and Nuclear Physics	22UPH5CC7	6	6	3	25	75	100
		Core Course – VIII (CC)	Analog Electronics	22UPH5CC8	6	6	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. Materials Science	22UPH5DSE1A	5	4	3	25	75	100
			B. Laser Physics	22UPH5DSE1B						
			C. Astrophysics and Cosmology	22UPH5DSE1C						
	IV	Ability Enhancement Compulsory Course- IV(AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Physics Concepts Through Animation (P)	22UPH5SEC2P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM		As per UGC Recommendation					
	Total					30	29			

Semester IV	Internal Marks: 25			External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS	
22UPH4CC5	ELECTRICITY, MAGNETISM AND ELECTROMAGNETISM	CC-V	6	6	

Course Objectives

- To develop knowledge in electrostatics and magnetostatics and apply theories of static and moving charges.
- To give idea on the fundamentals of electromagnetic conduction and electromagnetic waves.
- To extend the understanding of its applications to instruments involving electric and magnetic fields.
- To explore the applications of Electricity and Magnetism.
- To analyze various concepts in electromagnetism with real time applications.

Pre-requisites

- Knowledge about the concepts of electrostatic Potential.
- Fundamental knowledge of currents in a network circuits.
- Apply the concept of magnetic materials and its applications.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to	Cognitive Level
CO 1	Understand the basic laws of electrostatics, magnetostatics and Electromagnetism.	K1, K2
CO 2	Apply the Principles behind the electric and magnetic instruments.	K3
CO 3	Analyze the behavior of circuits containing Inductance, Capacitance and Resistance connected in different combinations.	K4
CO 4	Organize experiments to determine the absolute values of Q factor and power factor of LCR circuits.	K5
CO 5	Interpret the circuit into a mathematical problem using circuit laws and theorems.	K5

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	3	3	3	2	2	2	2
CO 2	3	3	3	3	3	3	2	2	2	2
CO 3	3	3	3	3	3	3	2	2	2	2
CO 4	3	3	3	3	3	3	3	3	2	2
CO 5	3	3	3	3	3	3	3	3	2	2

“1” – Slight (Low) Correlation
Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
“3” –
“-” – indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Electrostatics Coulomb's inverse square law - Gauss theorem and its applications - intensity at a point due to a charged sphere and cylinder - Principle of a capacitor - Capacity of spherical and cylindrical capacitors - Parallel plate capacitor - Effect of a dielectric - Energy stored in a capacitor - Loss of energy due to sharing of charges.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Current Electricity Current density - Equation of continuity- Grouping of cells - Theory of Ballistic Galvanometer - Figure of merit - Damping Correction - Kirchhoff's laws - Wheatstone Bridge – Carey Foster's Bridge- Potentiometer Calibration of ammeter and voltmeter - Comparison of resistance and capacitance.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Magnetostatics Biot-Savart's law and its applications- straight conductor, Circular coil, Solenoid carrying current - Divergence and curl of magnetic field- Magnetic vector potential - Ampere's circuital law- Intensity of magnetization - Susceptibility - Types of magnetic materials – Properties of dia,para and ferro magnetic materials - Cycle of magnetization – Hysteresis - B-H curve.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	ElectroMagnetic Induction Laws of electromagnetic induction - Self and mutual induction - Self-inductance of a solenoid - Mutual inductance of a pair of solenoids - Coefficient of coupling - Experimental determination of self (Rayleigh's method) and mutual inductance- Growth and decay of current in a circuit containing L and R- Growth and decay of charge in a circuit containing C and R- Measurement of High resistance by leakage.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	AC Circuits and Electromagnetic waves Alternating Current - average and RMS value - AC through L and R in series - AC through C and R in series - LCR series and parallel circuits - sharpness of resonance - Choke Coil. Maxwell's equations - Electromagnetic wave equation in free space and dielectric - Plane wave solutions - Poynting Theorem.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment: (Not to be included for External Examination) Applications of Capacitor - Superposition Theorem- Magnetic Circuit - Earth inductor - Transformer.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Murugesan R(2017), *Electricity and Magnetism*(10th edition), S. Chand and Co., New Delhi.
2. Brij Lal and N Subrahmanyam(2000), *Electricity and Magnetism*(8th edition), Ratan Prakashan Mandir, Agra.

Reference Books

1. Vasudeva D N(2013), *Fundamentals of Magnetism and Electricity*(2nd edition), S. Chand & Co, New Delhi.
2. Sehgal N K , Chopra K L and Sehgal D L(2014), *Electricity and Magnetism*(3rd edition), Sultan Chand and Sons, New Delhi.
3. Tiwari K K(2018) , *Electricity and Magnetism*(2nd edition), S. Chand and Company, New Delhi.
4. David J. Griffith(2015), *Introduction to Electrodynamics*(2nd edition), Prentice Hall of India.
5. Paul A. Tipler and G. Mosca(2003), *Physics for Scientist and Engineers*, W.H.Freeman, New York.

Web References

1. <https://nptel.ac.in/courses/115106122>
2. <https://www.edx.org/learn/physics/rice-university-electricity-and-magnetism-part-1>
3. <https://www.coursera.org/courses?query=electricity%20and%20magnetism>

Pedagogy

Chalk and Talk, Assignment, Group discussion and Quiz

Course Designer

Dr.R.Gayathri

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UPH4CC4P	ELECTRICITY AND MAGNETISM (P)	CP - IV	4	4

Course Objectives

- To develop practical knowledge of Electricity and Magnetism
- To enhance the experimental skills.
- To gain hands-on experience with a variety of techniques.
- To learn the basic principles and procedures of laboratory work.

Pre-requisites

- Basic knowledge on usage of scientific apparatus.
- Basic Physics principle in Electricity and Magnetism
- Understanding on circuit connection.

Course Outcome and Cognitive Level Mapping

CO Numer	CO Statement On the successful completion of the Course, the Students will be able to	Cognitive Level
CO 1	Apply the physics principle involved in the various instruments and also relate the principles to new application.	K1, K2
CO 2	Apply experimental approaches to correlate with physics theory to develop practical understanding.	K2,K3
CO 3	Relate the concept of electricity to a real time applications	K4
CO 4	Demonstrate knowledge and understanding of experiments in Electricity and Magnetism	K5
CO 5	Design and develop circuits which enhance the existing scientific knowledge.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	1	2	1	2	1	3	2	1	2	1
CO2	2	3	2	2	2	2	3	2	2	2
CO3	2	1	2	3	1	3	2	1	3	1
CO4	2	2	3	3	2	2	3	1	2	2
CO5	3	2	3	3	3	1	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no correlation

Syllabus

LIST OF EXPERIMENTS (Any 8)

1. Post Office Box – Temperature coefficient.
2. Carey Foster's Bridge – Specific Resistance
3. Potentiometer – Temperature coefficient of a coil
4. Potentiometer – Temperature coefficient of thermistor.
5. Potentiometer – High range voltmeter calibration.
6. Series and Parallel resonance circuits
7. Ballistic Galvanometer – Figure of merit.
8. B.G. – Absolute capacity of condenser.
9. Deflection and Vibration magnetometer- Determination of M and H
10. Field along the axis of a coil – Determination of M.

Text Book

1. Ouseph, C.C., Rao, U.J., Vijayendran, V., (2016). *Practical Physics and Electronics*. S. Viswanathan, Printers & Publishers Pvt Ltd., Chennai.

Reference Book

1. Prof. Namboodirippad M.N., Prof. Daniel, P.A., (1982). *B.Sc., Practical Physics*. G.B.C. Publications, Cochin.

Web References

1. <https://vlab.amrita.edu/index.php?sub=1&brch=192>
2. <https://vlab.amrita.edu/index.php?sub=1&brch=192&sim=972&cnt=1>
3. <https://vlab.amrita.edu/index.php?sub=1&brch=192&sim=346&cnt=1>

Pedagogy

Demonstration, Practical sessions and Viva-voce

Course Designer

Dr.R.Meenakshi

SEMESTER IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UPH4GEC2	PHOTOGRAPHY AND VIDEOGRAPHY	GEC-II	2	2

Objectives

- To acquire knowledge with modern cameras.
- To understand the concepts of Digital Photography & Sensitivity.
- To familiarize the concepts of various Lenses.
- To know the fundamentals of the shoot.
- To import the knowledge of getting creative with photography.

Pre-Requisites

- Understand the basic ideas about photography
- Knowledge about basic camera operations
- Skills to use various tools

Course Outcomes and Cognitive Level Mapping

CO No.	CO Statements On the successful completion of the course, the students will be able to	Knowledge Level
CO 1	Knowledge and skills in the use of basic tools, techniques, technologies and able to acquaint with basic camera operations.	K1
CO 2	Understanding of special features and utility purposes of various types of lenses and able to choose an appropriate lens for the job concerned	K2
CO 3	Demonstrate uses of cameras and lighting/digital technologies.	K2
CO 4	Utilize the concept of correct exposure and identify correct and incorrect exposure in photographs.	K3
CO 5	Apply understanding of aesthetics related to shooting and editing.	K3

Mapping with Programme Outcomes

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	2	2	3	3	3	2	2
CO2	2	3	2	2	2	2	3	2	2	2
CO3	2	2	3	2	3	2	2	3	2	3
CO4	2	2	2	3	3	2	2	2	3	3
CO5	2	2	3	3	3	2	2	3	3	3

“1” – Slight (Low) Correlation “
“3” – Substantial (High) Correlation

2” – Moderate (Medium) Correlation
“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction Digital Photography - Advantages and Disadvantages – SLR – Aperture – Shutter Speed – ISO Sensitivity	3	CO1 CO2 CO3 CO4 CO5	K1 K4 K2 K3 K3
II	Lenses Specialized Lenses – Telephoto Lens – Wide-Angle Lens – Lens Multiplication Factor - Zoom Lens – Prime Lens – Macro (or Close-Up) Lens – Fish-Eye Lens – Tilt and Shift Lenses	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K4 K3 K3
III	Composition Line - Rule of Odds - Rule of Thirds - The Phi Grid - Negative Space- Repetition - Color - Texture	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K2 K3 K4
IV	Shooting video with DSLR Fundamentals of the shoot – Exposure – Keeping the camera steady – Shooting to edit – Shooting Just Enough Variations – Watching and Learning from the Movies – Varying Focal Length – Mastering Shot Structure – Maintaining continuity between shots	9	CO1 CO2 CO3 CO4 CO5	K1 K4 K2 K3 K3
V	Getting Creative with Shoot Controlling Aperture for Effect – Finding the Best Angle – Using Camera Filters – Tooling with Camera Effects – Using Time-Lapse Photography	6	CO1 CO2 CO3 CO4 CO5	K1 K2 K2 K4 K3
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Applications of full frame camera, 50mm lenses, 100mm macro lenses, Tripods, Backlighting, Overhead angle.	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K2 K3 K4

Text Book

1. Black, (2013), *DSLR Photography for Beginners*, Independently Published, 1st Edition.
2. John Carucci, (2013), *Digital SLR video & Filmmaking for Dummies*, John Wiley & Sons, Inc.

Reference Book

1. Tom Clark, (2011), *Digital Photography Composition for Dummies*, John Wiley & Sons, Inc.

Web References

1. www.digital-photography-school.com
2. <https://www.linkedin.com/in/singhofen/>
3. <https://dev.to/singhofen>
4. <https://codepen.io/csinghofen>

Pedagogy:

Chalk and talk, Assignment, power point presentation.

Course Designer

Dr. K. Kannagi

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UPH4SEC1P	WEB DESIGNING (P)	SEC - I	2	2

Course Objectives

- To understand the concepts in web design.
- To design a webpage with font and colour variation.
- To develop a webpage using HTML tags.
- To animate the webpage.
- To apply the HTML tag to create the webpage.

Pre-requisites

- Basics of webpage designing.
- Fundamental ideas on HTML.
- Basics of Flash and Photoshop.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Identify the basic tags used in an HTML document.	K1
CO2	Demonstrate the animating webpages.	K2
CO3	Develop HTML code for the webpage.	K3
CO4	Create formatting and link webpages.	K4
CO5	Make their own web page.	K5

Mapping with Programme Outcomes

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	1	2	2	2	2	3	3	2	2	2
CO2	2	2	2	3	3	3	3	2	2	3
CO3	2	2	2	2	3	3	3	2	3	3
CO4	2	2	2	2	3	3	3	2	3	3
CO5	2	2	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no correlation

Syllabus

LIST OF EXPERIMENTS (Any 8)

1. Web page to demonstrate font variations.
2. Web page illustrating text formatting tags.
3. Sample code to illustrate three lists in HTML.
4. HTML page with seven separate lines in different colors. State color of each line in its text.
5. HTML code to form a table.
6. Web page for form filling.
7. HTML program for personal website.
8. HTML code to design your own curriculum vitae.
9. Web page to explain concepts using hyperlinks.
10. Web page to explain concepts using animated picture, movie and sound.

Text Books

1. Weixel et al, (2004). *Multimedia Basics*.(First Edition) Thomson Course Technology, India.
2. Xavier C, (2007). *Web Technology and Design*.(First Edition). New Age International, New Delhi.

Reference Books

1. Srivastava R N, (2011). *Web Technology*. (First Edition). Global Academic Publishers & Distributors.
2. Daniel Gray, (2000). *Web Design Fundamentals Hand Book*. (First Edition). Sun Rise Printers Shahdara, Delhi.

Web References

1. <https://www.w3schools.com/html>
2. <https://nptel.ac.in/courses/106/105/106105084/>
3. [HTML Color Names \(w3schools.com\)](https://www.w3schools.com/html/html_color_names.asp)
4. [HTML page with 7 separate lines in different colors. State color of each line in its text - RakeshMgs](#)
5. [How to create a CV using HTML and host in github ? - GeeksforGeeks](#)

Pedagogy

Demonstration, Practical sessions and viva-voce.

Course Designer

Dr. B. Anitha

Semester V	Internal Marks: 25			External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS	
22UPH5CC6	OPTICS	CC-VI	6	6	

Course Objectives

- To study the nature of light waves.
- To understand the basic ideas of geometric optics.
- To differentiate between optical properties like diffraction and interference.
- To gain knowledge on the working principles of optical instruments.
- To design simple optical instruments with fundamental ideas.

Pre-requisites

- Knowledge about the behavior of light waves.
- Fundamental knowledge of the different characteristics.
- Basic ideas of the different optical instruments.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to	Cognitive Level
CO 1	Understand the basic principles of light waves.	K1, K2
CO 2	Analyze the characteristics of optical waves.	K3
CO 3	Classify different properties of light waves like interference, polarization and diffraction.	K4
CO 4	Develop practical knowledge of different optical instruments and their applications	K5
CO 5	Design simple optical instruments by applying the concepts of light waves.	K5

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	2	3	3	3	2	3	3
CO 2	3	3	3	3	3	3	2	2	3	3
CO 3	3	3	3	3	3	3	3	2	3	3
CO 4	3	3	3	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Geometrical Optics Lenses – Introduction- Conjugate Points-Planes and Distances-Location of the image-Lens Maker's Equation-Newton's Lens Equation-Magnification. Lens aberrations - Spherical aberrations -Coma-Astigmatism - Curvature of field- Distortion - Chromatic aberrations.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Interference Fresnel's Biprism - Lloyd's single mirror experiments - Achromatic fringes-Haidinger Fringes -Fringes in wedge shaped films - Newton's Rings - Michelson's interferometer - Determination of wavelength and refractive index- Reflective and antireflective coatings –Interference filters	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Diffraction Rectilinear propagation of light - Zone plate - Fresnel diffraction - Diffraction at circular aperture, circular disc and a straight edge - Fraunhofer diffraction - Diffraction at a single and double slit - Missing orders in double slit - Theory of diffraction grating - Determination of wavelength - Dispersive power - Rayleigh's criterion and resolving power of a prism and telescope.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Polarization Plane of polarization - Brewster's law - Malu's law - Double refraction - Nicol prism - Huygen's explanation of double refraction - Elliptically and circularly polarized light -Quarter and half wave plates - Production and determination of plane, elliptically and circularly polarized light - Optical activity - Fresnel's theory-Specific rotation-Laurent's half shade polarimeter.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Optical Instruments Microscopes - Simple Microscope (Magnifying glass) - Compound Microscope - Ultra-Microscope - Eyepieces - Huygen's Eyepiece - Ramsden's Eyepiece - Comparison of Eyepieces - Telescope - Refracting astronomical telescope - Abbe Refractometer - Pulfrich refractometer - Photographic Camera - Prism binoculars.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Types of Lenses -Applications of thin film interference - Difference between interference and diffraction- Photo elasticity – Modern optical devices	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Dr. Subramaniam N, Brijlal and Dr.Avathanulu M N, (2016). *A Textbook of Optics*. (25th Revised Edition),S. Chand & Co. Pvt.Ltd., New Delhi.
2. Ajoy Ghatak, (2010). *Optics*. (6th Edition), Tata McGraw Hill Co., Mumbai.

Reference Books

1. Kakani S L, Bhandari K C, (2002). *A Text Book of Optics* (2nd Edition), S.Chand and Sons, New Delhi.
2. Murugesan R , Kiruthiga Sivaprasath,(2003).*Optics and Spectroscopy*(Reprint),S.Chand and Sons, New Delhi.

Web References

1. <https://www.youtube.com/watch?v=ML7HcZo6IaE>
2. <https://www.physicsclassroom.com/class/waves/Lesson-3/Interference-of-Waveshttps://www.digimat.in/nptel/courses/video/108105102/L28.html>
3. <https://www.toppr.com/guides/physics/wave-optics/diffraction/>
4. <https://www.physicsclassroom.com/class/light/Lesson-1/Polarization>
5. <https://archive.nptel.ac.in/courses/115/105/115105104/>

Pedagogy

Chalk and Talk, Assignment, Power Point Presentation, E-content, Group discussion and quiz.

Course Designer

Dr.D.Devi

Semester V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UPH5CC5P	GENERAL AND ELECTRONICS (P)	CP-V	3	3

Course Objectives

- To acquire knowledge of spectrometry and to find optical constants.
- To impart the knowledge about the vibrator circuits.
- To analyze the various parameters related to operational amplifiers.
- To understand the working of amplifiers.
- To enable the students to gain knowledge of basic gate through discrete components.

Pre-requisites

- Fundamental knowledge and hands on experience of general and electronics experiments of Physics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to	Cognitive Level
CO 1	Explain the basic concepts of experimental physics.	K2
CO 2	Understand knowledge the principles of amplifiers and vibrators through the experiments	K2
CO 3	Explore the concepts of spectrometry involved in the optical instrument.	K3
CO 4	Verify experimentally the concepts about Logic circuits	K4
CO 5	Develop the skill in handling instruments in the construction of circuits	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	1	2	1	2	2	2	2	1	2	1
CO 2	1	2	2	2	2	2	2	2	2	1
CO 3	1	2	2	2	2	2	2	2	1	1
CO 4	2	2	2	2	3	2	2	2	1	1
CO 5	2	2	2	2	3	2	2	2	1	1

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” - indicates there is no correlation

Syllabus

LIST OF EXPERIMENTS (ANY 8)

1. Spectrometer – Prism - Dispersive power.
2. Spectrometer - Cauchy's constants.
3. Koenig's method – Uniform bending.
4. Regulated power supply using Zener diode - Percentage of regulation.
5. FET Characteristics.
6. Emitter follower.
7. Astable Multivibrator.
8. AND, OR and NOT gates using discrete components.
9. Op - Amp -Adder and Subtractor.
10. Transistor Characteristics – Common Base.
11. Full wave Bridge rectifier.
12. Hartly oscillator.

Text Book

1. Ouseph C.C., Rao, U.J., &Vijayendran, V. (2009), *Practical Physics and Electronics*, S. Viswanathan, Printers & Publishers Pvt Ltd
2. Dr. Somasundaram S, (2012), *Practical Physics*, Apsara Publications
3. S. Poornachandra *Electronic Laboratory Primer a design approach*, B. Sasikala, Wheeler Publishing, New Delhi.
4. *Electronic lab manual Vol I*, K A Navas, Rajath Publishing

Reference Book

1. Jones, B.K., (1986). *Electronics for Experimentation and Research*. Prentice-Hall.
2. Zbar, P.B., Malvino, A.P., & Miller, M.A., (1994). *Basic Electronics: A Text-Lab Manual*. Tata Mc-Graw Hill, New Delhi.
3. *Advanced Practical Physics*, S.P Singh, Pragati Prakasan.
4. *An advanced course in Practical Physics*, D. Chattopadhaya, C.R Rakshit, New Central Book Agency Pvt. Ltd
5. *Op-Amp and linear integrated circuit*, Ramakanth A Gaykwad, Eastern Economy Edition.

Web References

1. <https://www.msuniv.ac.in/Download/Pdf/b2efcbdbc4be452>
2. <https://www.studocu.com/in/document/reva-institute-of-technology-and-management/bachelors/MSc electronics-lab-student-copy/17586392>
3. <https://www.vlab.co.in/broad-area-physical-sciences>

Pedagogy

Demonstration, Practical Sessions and Viva Voce

Course Designer

Dr. S. Priya

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UPH5CC7	ATOMIC AND NUCLEAR PHYSICS	CC – VII	6	6

Course Objectives

- To acquire the knowledge of Atomic Structure.
- To understand the concepts of electronic structure of atoms.
- To know the structure of atom and nucleus using different models.
- To familiarize the concepts of nuclear reactions.
- To impart the knowledge of nuclear detector and accelerators.

Pre-Requisites

- Basic properties of electromagnetic rays.
- Impart knowledge in electronic configuration of atoms.
- Develop knowledge about the concepts of nuclear physics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to,	Cognitive Level
CO 1	Understand the knowledge of basic properties of Cathode rays and Positive rays. Calculate the values of e/m and Critical potential.	K1, K2
CO 2	Extend the concept of vector atom model to draw the electronic configuration of atoms and the Periodic classification.	K2
CO 3	Apply the Quantum mechanical principles in Spectral transitions (Lande's 'g' factor)	K3
CO 4	Recall the properties of Thomson's Parabola method, spin motion of electrons, experimental methods to detect particles.	K4
CO 5	Discuss the concept of quantum numbers, special lines, nuclear transformations and particle detector in nuclear physics.	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	3	3	3	3	3	3	2	2	2
CO 2	2	3	3	3	3	3	3	2	2	2
CO 3	2	3	3	3	3	3	3	2	2	2
CO 4	2	3	3	2	3	3	3	2	2	2
CO 5	2	3	3	2	3	3	3	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” - indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	CATHODE RAYS AND POSITIVE RAYS Cathode rays-properties-e/m of cathode rays-Milliken's oil drop method-Positive rays-Properties-e/m of Positive rays: Thomson's parabola method-Aston's Bainbridge-Determination of critical Potential-Franck and Hertz's experiment - Davi's and Goucher method	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	VECTOR ATOM MODEL Various quantum numbers, L-S and J-J Coupling-Pauli's exclusion principle-electronic configuration of elements and periodic classification-magnetic dipole moment of electron due to orbital and spin motion-Bohr magneton-Stern and Gerlach experiment.	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	FINE STRUCTURE OF SPECIAL LINES Special terms and notations-selection rules- intensity rule and internal rule-Fine structure of sodium D lines-Alkali spectra-Fine structure in Alkali spectra- spectrum of Helium-Zeeman effect-Larmor's theorem-Debye's quantum mechanical explanation of the normal Zeeman effect-Anamolous Zeeman effect-theoretical explanation- Lande's 'g' factor and splitting of D1 and D2 lines of sodium.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	STRUCTURE OF NUCLEI AND NUCLEAR TRANSFORMATIONS Nuclear Structure: Basic properties of nuclei-Mass defect and Binding energy-Packing Fraction-Stable Nuclei-Liquid drop model - Shell Model. Nuclear Transformations: Radioactive decay-Half life-Mean life-Properties of α , β , γ -rays- successive disintegration and equilibriums-Cross section—Nuclear reactions-Nuclear fission and fusion-Nuclear reactors.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	PARTICLE DETECTORS AND PARTICLE ACCELERATORS Particle Detectors: Wilson Cloud chamber- ionization chamber-Geiger Muller Counter-solid state detectors. Particle Accelerators: Cyclotron-Betatron-Synchrotron-electron synchrotron and proton synchrotron.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Electronic structure of atoms-Elementary particles-Interactions and particles-Leptons-Hadrons-Elementary Particle Quantum numbers-Quarks-Field Bosons	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Text Books

1. Subrahmanyam N and Brijlal and seshan, (2007), *Atomic and nuclear Physics*, S. Chand, Revised edition.
2. Murugesan Kiruthiga Sivaprasath R, (2011), *Modern Physics*, S. Chand, Revised edition.
3. Beiser. Shobhit mahajan S. Rai Choudhury, (2009), *Perspectives of Modern Physics*, Tata McGraw Hill, 6th edition.

Reference Books

1. Serway R. A., Moses C. J. and Moyer C. A., (2004), *Modern Physics*, 3rd Edition, Brooks/Cole Publications.
2. Semat H, and Albright J. R., (1985), *Introduction to Atomic and Nuclear Physics*, 5th Edition, Chapman and Hall.
3. Ghosal S. N., (2007), *Atomic Physics*, S. Chand, Revised edition.
4. Ghosal S. N., (2008), *Nuclear Physics*, S. Chand, Reprint.

Web References

1. <https://oyc.yale.edu/physics>
2. <https://ocw.mit.edu/courses/physics/>
3. <https://www.digimat.in/nptel/courses/video/115104043/L01.html>

Pedagogy

Chalk and talk, PPT, Quiz, Seminars, Assignment and Group discussion.

Course Designer

Dr. R. Mekala

Semester V	Internal Marks: 25			External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS	
22UPH5CC8	ANALOG ELECTRONICS	CC - VIII	6	6	

Course Objectives

- To provide the knowledge of intrinsic, extrinsic semiconductors.
- To acquire a diversified knowledge on semiconductors and diodes
- To impart the knowledge about the transistor characteristics in different configurations and its characteristics.
- To grasp the basic ideas of feedback and its application in amplifiers and oscillators
To gain the knowledge on the special semiconductor devices and operational amplifiers.

Pre-Requisites

- Basic ideas on semiconductors and oscillators.
- Import basic mathematical knowledge.
- Understanding of Transistors and other electronic devices and its operations.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to,	Cognitive Level
CO 1	Outline knowledge of semiconductors, transistors, rectifiers, operational amplifiers and different types of semiconductor devices.	K1,K2
CO 2	Outline the idea on action of transistors, diodes, special semiconductor devices and operational amplifiers.	K2,K3
CO 3	Identify the operation of transistor, diodes, amplifiers, oscillators, operational amplifier and special semiconductors devices and its characteristics	K3,K4
CO 4	Construct the various mathematical operations of transistors, diodes, amplifiers, oscillators, operational amplifier and special semiconductors devices	K4, K5
CO5	Analyze the amplitude and frequency response and characteristics of transistors, diodes and special semiconductors devices	K4, K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	2	2	3	2	3	2	3	3	3
CO 2	2	2	2	2	2	3	2	3	3	3
CO 3	3	3	3	3	3	3	2	3	3	3
CO 4	2	3	3	2	3	3	2	3	3	3
CO 5	3	2	2	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” – indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	SEMICONDUCTORS AND DIODES Intrinsic and Extrinsic semiconductor-n-type semiconductor-p-type semiconductor-PN junction diode-Biasing of PN junction –V-I characteristics of PN junction – Rectifier - Half wave rectifier- Full wave rectifier and Full wave bridge rectifier-Zener diode-Characteristics of zener diode-Zener as a voltage stabiliser-Light Emitting Diode (LED)-Photo diode-LED-Tunnel diode- Filters – Types of filters.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	CIRCUIT ANALYSIS AND TRANSISTORS Circuit Analysis: Kirchhoff's Current law (KCL)-and Voltage law (KVL)-Thevenin's theorem- Norton's theorem. Transistor - Naming the transistor terminals-Transistor Action - Transistor as a Amplifier - Transistor Connections-Common Base and Common Emitter connection- Characteristics of Common Base and Common Emitter connection - Transistor load line analysis- Operating point -Faithful amplification - Transistor Biasing- stabilization- stability factor.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	AMPLIFIERS AND OSCILLATORS Single stage Transistor amplifier-Practical Circuit of transistor Amplifier- D.C and A.C Equivalent circuits- Power amplifiers-Classification of Power Amplifiers- Expression for Collector Efficiency-Efficiency of Class A and Class B amplifiers- Push- pull amplifiers. Feedback-Negative voltage feedback in amplifier- Principle-Gain-Emitter Follower-Sinusoidal Oscillator- Types-Oscillatory Circuit- Positive feedback amplifier - Barkhausen criterion-Colpitt's oscillator- Hartley oscillator.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	SPECIAL SEMICONDUCTOR DEVICES Types of Field Effect Transistor-Junction Field Effect Transistor (JFET)-Difference between JFET and Bipolar Transistor-Metal Oxide Semiconductor FET (MOSFET)-Types of MOSFET- Silicon Controlled Rectifier (SCR)- V-I Characteristics of SCR-SCR as a switch –Uni junction Transistor (UJT)-UJT relaxation oscillator.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	OPERATIONAL AMPLIFIERS Op-amp characteristics-Common mode rejection ratio (CMRR)-Inverting and Non inverting amplifier- Adder, Subtractor, Integrator, Differentiator-Voltage follower-Op-amp comparator-Log & antilog amplifier- Filters-low, high pass and band pass filters.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Astable multivibrator - Monostable multivibrator – bistable - Methods of transistor biasing- Base resistor method-Voltage divider bias method.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Mehta V.K. & Rohit Mehta (2012). *Principles of Electronics* (11th edition) S.Chand.
2. Chattopadhyay. D, Raxshit P.C, Sara B.and Purkait (2006). *Foundations of electronics* (7th edition) New Age International.
3. Vijayendran.V, (2010). *Introduction to Integrated Electronics*.(6th edition)
S. Viswanathan Printers and Publishers Pvt. Ltd., Chennai.
4. Salivahanan S, Suresh Kumar N, (2011). *Electronic Devices and Circuits*. (2nd edition) Tata McGraw Hill Education New Delhi.

Reference Books

1. Theraja. B.L, (2012) *Basic electronics solid state*. (Reprint (2012)) S.Chand
2. Millman and Halkias, (2008) *Integrated Electronics* (48th Reprint) Tata McGraw Hill Education. New Delhi.

Web References

1. <https://www.educba.com/digital-computer-fundamentals/>
2. <https://collegedunia.com/exams/number-system-mathematics-articleid-3097>
3. <https://www.tutorialspoint.com/difference-between-half-adder-and-full-adder>
4. <https://electronicsdesk.com/8085-microprocessor.html>
5. <https://www.digimat.in/nptel/courses/video/108105102/L01.html>

Pedagogy

Chalk and Talk, Seminars, Power Point Presentation, Quiz, Assignment and Group discussion.

Course Designer

Dr.T.Noorunnisha

Semester V	Internal Marks: 25			External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS	
22UPH5DSE1A	MATERIALS SCIENCE	DSE-I	5	4	

Course Objectives

- To formulate the knowledge in material science and to understand the chemical structure and bonding between the molecules
- To gain cognition on the defects in materials
- To acquire the knowledge about smart materials and its mechanical properties
- To develop the understanding of Nanomaterials and its property correlation
- To know the concept of materials for nuclear and space applications

Pre-requisites

- To know the relationship between different types of crystal structures with the properties of materials
- To gain the physical property of condensed matter is intimately related to their electronic structure
- To emphasise the structure-property correlation in materials

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to	Cognitive Level
CO 1	Interpret the different types of crystal structure and bonding in solids, and the physical ramifications of these differences.	K1
CO 2	Explain out the different kinds of technological properties of materials	K2
CO 3	Identify the Smart materials in the material engineering and to understand their role in materials behavior	K3
CO 4	Examine the Nanomaterials on explaining the mechanical behavior of materials	K4
CO 5	Develop the Nuclear materials and their use in space	K5

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	2	3	3	2	3	3	2	3
CO 2	2	3	3	2	3	2	3	3	2	2
CO 3	3	3	3	2	3	2	2	3	3	3
CO 4	3	2	3	3	3	3	2	3	2	2
CO 5	2	2	3	3	3	2	3	3	2	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	CRYSTAL STRUCTURE AND CHEMICAL BONDS Introduction to crystals – Classification of crystal system – Bravais lattice – Lattice planes and Miller indices – Interplanar spacing in a cubic lattice – Cubic lattice – SC – BCC – FCC – Sodium chloride and Diamond crystal structure – Bonding of solids (Ionic, Covalent, Metallic, Hydrogen and Vander Waal)	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	TECHNOLOGICAL PROPERTIES Introduction to material science – Classification of engineering materials – Structure – Property relationships in materials - Stability and metastability – Selection of materials – Weldability – Machineability – Formability – Castability.	14	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	SMART MATERIALS Metallic glass – Fiber reinforced materials – SAW materials – Biomaterials – Ceramics -Nuclear engineering materials-Nanophase materials - SMART materials- Conducting polymers- Optical materials - Fiber optic materials and their applications.	11	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	NANO MATERIALS AND MECHANICAL BEHAVIOUR OF MATERIALS Nanoscience and nanotechnology – Nanomaterials- Properties of nanomaterials (size dependent) - synthesis of nanomaterials- Fullerenes-Application of nanomaterials – Carbon nanotubes- Fabrication and structure of carbon nano tubes Different mechanical Properties of engineering materials – Fracture – Creep – Testing technique –factors affecting mechanical properties of material- Heat treatment-cold and hot working-types of mechanical tests- Metals forming process – Deformation of crystals and polycrystalline materials.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	MATERIALS FOR NUCLEAR AND SPACE APPLICATIONS Nuclear fuels - fuel cladding- moderators, control materials -coolants - shielding materials - Space programme - structural material and their properties - system requirements - extreme high temperature materials - materials for thermal protection - pressure vessels - lubrication.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Hybridisation - Delocalised chemical bonding-Diamond and Zinc sulphide structures. Close packed structures - packing efficiency and density of materials.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Arumugam, M., (2009). *Material Science* (1st edition) Anuradha agencies, Kumbakonam.
3. Raghavan V., (2004). *Material Science Engineering*. (5th edition) PrIntice Hall ,India
4. Avadhanulu, M.N., (2014) *Material Science*, S.Chand & Company, New Delhi, 2014.
5. Hayra Choudhury S.K., (1991). *Materials Science and Processes*. (1st edition) Indian Book Distributing Co, New Delhi.

Reference Books

1. Pillai S.O., (2005). *Solid State Physics* (6th edition) New age International Private Limited

Web References

1. <https://archive.nptel.ac.in/courses/113/102/113102080/>
2. <https://archive.nptel.ac.in/courses/122/102/122102008/>
3. https://archive.nptel.ac.in/content/storage2/courses/112108150/pdf/Lecture_Notes/MLN_01.pdf
4. <https://nptel.ac.in/courses/118104008>

Pedagogy

Chalk and Talk, Power point presentation, Interaction, Problem solving Assignment.

Course Designer

Dr.S.Gowri

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UPH5DSE1B	LASER PHYSICS	DSE - I	5	4

Course Objectives

- To gain knowledge in the basic of lasers.
- To explain the fundamentals of lasers and its types.
- To analyze the properties of laser.
- To differentiate the types of lasers.
- To familiarize with the diverse applications of laser.

Pre-requisites

- Basic knowledge about electromagnetic radiation.
- Fundamental knowledge on absorption and emission.
- Basic ideas on application of lasers.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, the students will be able to	Cognitive Level
CO1	Define the characteristics of electromagnetic radiation and their interaction with matter.	K1
CO2	Explain the basic principle of laser.	K2
CO3	Apply the functions of laser for practical applications in various field.	K3
CO4	Differentiate the various types of lasers and their working principle.	K4
CO5	Summarize properties of laser and its applications.	K5

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	1	3	3	3	3	3	2	1	2	3
CO 2	2	3	3	3	2	3	2	1	2	2
CO 3	1	3	3	3	3	3	3	1	3	3
CO 4	2	3	3	3	3	3	3	1	3	2
CO 5	3	3	3	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” – indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	PRINCIPLES OF LASER Introduction to electromagnetic radiation - Principle of lasers - Conditions of lasing action - Absorption - Emission - Einstein's co-efficient - Population inversion - Laser pumping - Stimulated and spontaneous emission - Two and three level laser systems.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	CHARACTERISTICS OF LASER Monochromaticity - Coherence - Directionality and divergence - Brightness - Laser modes: Longitudinal mode - Transverse mode - Beam quality - Threshold condition - Line shape functions - Mode locking - Q - Switching.	14	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	TYPES OF LASERS Solid state lasers - Ruby laser- Nd: YAG Laser - Semiconductor lasers - Features of semiconductor lasers- Diode lasers - Gas laser: He-Ne laser - CO2 laser - Liquid lasers: dye lasers - Chemical lasers.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	LASERS IN INDUSTRY AND COMMUNICATION Laser cutting - Welding - Drilling - Hardening - Fibre optic communication -Total internal reflection - Block diagram of fibre optic communication system - Advantages of fibre optic communication - Hologram - Recording and reconstruction of hologram - LIDAR.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	LASERS IN MEDICAL AND MILITARY APPLICATIONS Lasers in Surgery - Ophthalmology - Dentistry- Dermatology - Lasers in cancer diagnosis and therapy- Cardiology - Laser range finder - Target designation.	14	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF-STUDY FOR ENRICHMENT (Not included for End Semester Examinations) Laser induced photochemical processes - Multiphoton Infrared Excitation - Unimolecular Laser Induced Reaction.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Nagabhushana S (2013). *Laser and Optical Instrumentation*. I. K. International Publishing House, New Delhi.
2. Srivastava S K (2019). *Laser Systems and Applications*. 3rd Edition. New Age International Publisher, New Delhi.
3. Laud B B (2011). *Laser and Nonlinear Optics*. 3rd Edition. New Age International Publisher, New Delhi.
4. Thyagarajan K et. al. (1986). *Lasers Theory and Application*. 2nd Edition. Plenum Press

Reference Books

1. Seigman, (1986) *Lasers*. 3rd Edition. Oxford University Press.
2. Seelto O, (2010) *Principles of Laser*. 5th Edition. Springer Publication.

Web References

1. [Interaction of Radiation with Matter - Physics LibreTexts](#)
2. [Types of Lasers - Search \(bing.com\)](#)
3. [Properties of Lasers \(worldoflasers.com\)](#)
4. [Applications of Lasers - Search \(bing.com\)](#)
5. https://application.wiley-vch.de/books/sample/3527327150_c01.pdf
6. <https://nptel.ac.in/courses/104/104/104104085/>

Pedagogy

Chalk and Talk, Seminar, Assignment, Power point Presentation, Group discussion and Quiz.

Course Designer

Dr. B.Anitha

Semester V	Internal Marks: 25			External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS	
22UPH5DSE1C	ASTROPHYSICS AND COSMOLOGY	DSE - I	5	4	

Course Objectives

- To learn the composition and nature of the universe from solar system.
- To gain the knowledge of astronomy and celestial mechanics.
- To gain knowledge about stars and stellar evolution, interstellar matter, galaxies, and clusters of galaxies.
- To provide the basic knowledge about the theory and techniques of observational astronomy and physics of the astrophysical phenomenon.
- To learn the large scale structure of the Universe and its history.

Pre-requisites

- Basic knowledge of the principles of Physics
- Knowledge about astronomical concepts
- Experience to interpret data through the use of mathematical tools.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to	Cognitive Level
CO 1	Understand Tools of Astronomy and celestial mechanics.	K1, K2
CO 2	Apply mathematical tools and physics laws to understand the nature of Planets, Stars and Galaxies.	K3
CO 3	Understand the astronomical observations for the celestial objects.	K4
CO 4	Analyses the results and interpret the nature of the solar system, variety of stars and galaxies.	K5
CO 5	Interpret the concepts of projects in astronomy.	K5

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	3	3	2	3	3	2	2	2	3
CO 2	3	2	3	3	2	3	2	2	2	2
CO 3	2	3	2	3	3	2	2	3	2	3
CO 4	3	3	3	2	3	3	3	3	2	2
CO 5	3	3	3	3	2	3	3	3	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Astronomical Scales Astronomical Distance, Mass and Time Scales- Brightness, Radiant Flux and Luminosity- Measurement of Astronomical Quantities- Astronomical Distances-Stellar Radii - Masses of Stars Stellar Temperature	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Basic Concepts of Positional Astronomy Celestial Sphere -Geometry of a Sphere-Spherical Triangle - Astronomical Coordinate Systems: Geographical Coordinates - Horizon System- Equatorial System-Conversion of Coordinates- Measurement of Time: Sidereal Time - Apparent Solar Time-Mean Solar Time - Equation of Time- Calendar	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Astronomical Techniques Basic Optical Definitions for Astronomy- Magnification Light Gathering Power-Resolving Power and Diffraction-Limit-Atmospheric Windows-Optical Telescopes Types of Reflecting Telescopes-Telescope Mountings Space Telescopes- Detectors and their Use with Telescopes-Types of Detectors-Detection Limits with Telescopes	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Nature Of Stars and Galaxies Classification of binary stars- Mass determination using visual binaries –Formation of spectral line- Hertzprung –Russel diagram – Hubble sequence- Spiral and Irregular galaxies – Spiral structure- Elliptical galaxies - Interaction of galaxies – Formation of galaxies	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Cosmology Newtonian Cosmology Olbers's Paradox- Cosmological principle- Dust model of the universe- Evaluation of the pressureless dust universe Microwave background Steady state model of the universe- Cooling of the universe after the big bang- Discovery of the Cosmic micro wave background - origin cosmic microwave background Relativistic cosmology Euclidean - Elliptic and Hyperbolic geometries - Robertson Walker Metric for curved space time- Friedmann equation - Cosmological constant- Effects of dark energy Observational cosmology Origin of the cosmological red shift- Distance to the most remote objects in the universe- Particle Horizon and Horizon distance	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self Study for Enrichment: (Not to be included for External Examination) The shape and size of our Galaxy- Interstellar extinction and Reddening-Galactic coordinates, Galactic rotation-Stellar population-Inter Stellar Medium- The galactic magnetic field and Cosmic rays	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Bradley W. Carroll & Dale A. Ostlie (2006), *An introduction to Modern Astrophysics* (Second Edition) Pearson
2. IGNOU(2006), *Basics of Astronomy - IGNOU course book PHE-15 Astronomy and Astrophysics* (First Edition), Neeraj Publications

Reference Books

1. Harwit M. (2000), *Astrophysical concepts*(Second Edition),Springer
2. G. B. Rybicki & Lightman A. P.(1986), *Radiative processes in astrophysics* (Second Edition), Wiley-VCH)

Web References

1. <https://egyankosh.ac.in/handle/123456789/19452>
2. <https://egyankosh.ac.in/handle/123456789/6051>

Pedagogy

Chalk and Talk, Assignment, Group discussion and Quiz

Course Designer

Dr.R.Meenakshi

Semester V	Internal Marks:40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UPH5SEC2P	PHYSICS CONCEPTS THROUGH ANIMATION (P)	SEC-II	2	2

Course Objectives

- To provide a basic skill in Simulation and Photoshop
- To create a physics-oriented animations using Flash package
- To expose the Photoshop tools to prepare physics-oriented objects
- To develop the skill of animation diagrams through physics concepts
- To formulate 3D-Animation to prepare physics-oriented objects

Pre-requisites

- Explore and understand the phenomenon of physics
- Create animation to learn physics and understand the concepts
- Output the concept in physics-based animation

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to	Cognitive Level
CO 1	Develop the skills to simulate physics concepts.	K1, K2
CO 2	Construct the animation of physics-oriented objects using flash.	K3
CO 3	Construct the basic circuit diagram of physics using photoshop.	K4
CO 4	Examine the skill of animation to prepare physics-oriented objects.	K5
CO 5	Develop video through physics concepts 3D Animation.	K5

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	1	1	1	2	1	3	2	1	2	1
CO 2	2	3	2	2	2	3	3	1	2	1
CO 3	1	1	2	3	1	3	2	1	3	1
CO 4	2	3	3	3	2	1	3	1	3	2
CO 5	2	3	3	2	2	2	2	1	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation

Syllabus

LIST OF EXPERIMENTS (Any 8)

1. Create an animation of Simple Pendulum
2. Create an animation of Atomic Model
3. Create an animation of Dispersion of Light
4. Create an animation of Projectile Motion
5. Create an animation of Law of Gravitation
6. Create an animation of Newton's Law
- 7 Create an animation of Kepler's law of ellipses
- 8 Create an animation of Photoelectric effect
9. Create an animation of Magnetic Forces on the Segments of a Current Carrying Loop
10. Draw a simple Physics Circuit

Text Book

1. Kogent Learning Solutions.,(2013) *Flash CS6 in simple Steps*(Revised edition). Dreamtech Press.
2. DT Editorial Services., (2018), *Photoshop CS6 in Simple Steps*,(New edition) Dreamtech Press.

Reference Book

1. Daven Brown and et.al.,(1997) ,*Web Development for the Designer*, Macmillion

Web References

1. <https://www.udemy.com/course/animation-in-flash/>
2. <http://www.floobynooby.com/flashcourseA.html>
3. https://phys23p.sl.psu.edu/phys_anim/EM/mag_torque_loop.mp4

Pedagogy

Demonstration, Practical sessions, Group discussion and Survey.

Course Designer

Dr.S.Gowri

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCH4AC6	PHYSICS - II	SECOND ALLIED COURSE - III	4	3

Course Objectives

- To provide the basic knowledge about the concepts of current electricity.
- To introduce the basic concepts of magnetostatics.
- To understand modern wave mechanics, which are basic for modern physics.
- To apply the principles of electronics in day to life.
- To understand the modern lasers and digitization of computers.

Pre-Requisites

- Basic laws of electricity.
- Fundamental knowledge in modern physics.
- Get in-depth knowledge about the concepts of digital electronics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to,	Cognitive Level
CO 1	Acquire knowledge on elementary ideas of electricity, magnetism, modern and laser physics, digital electronics.	K1, K2
CO 2	Able to understand the knowledge on basic laws of current electricity, different types of magnetism, wave mechanics and modern laser, electronics.	K2
CO 3	Recall the of elementary ideas of electricity and magnetism, modern wave mechanics and digitization of computers.	K3
CO 4	Analyze the behavior of laser physics and modern physics in our day-to-day life.	K4
CO 5	Discuss the characteristics of Kirchoff's law and Specific resistance, photoelectric effect, types of lasers and modern electronics.	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	3	3	3	3	3	3	3	3	3
CO 2	2	3	3	3	3	3	3	2	2	3
CO 3	2	3	3	3	3	3	3	3	3	3
CO 4	2	3	3	2	3	3	3	3	2	3
CO 5	2	3	3	2	3	3	3	3	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” - indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	CURRENT ELECTRICITY Ohm's law–Law of resistance in series and parallel–Specific resistance–capacitor–capacitors in serial and parallel–Kirchoff's laws–Wheatstone's network – condition for balance. Carey Foster's bridge – measurement of resistance–measurement of specific resistance–determination of temperature coefficient of resistance–Potentiometer–calibration of Voltmeter.	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	MAGNETISM Intensity of magnetization-Susceptibility-Types of magnetic materials-Properties of para, dia and ferromagnetic materials-ferrimagnets and their applications-Hysteresis-Experiment to draw M-H curve (Horizontal Method)-energy loss in hysteresis.	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	MODERN PHYSICS Photo electric effect–Laws of photo electric effect – Einstein's photo electric equation–verification of Einstein's photo electric equation by Millikan's experiment–photo electric cells–applications. Wave mechanics: De Broglie concept of matter waves – characteristics and calculation of De Broglie wave length -Study of De Broglie matter wave by G. P. Thomson Experiment.	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	LASER PHYSICS Laser: Basics of Lasers-Principle of Laser-Stimulated Absorption-Stimulated Emission-Spontaneous Emission- population inversion–meta stable state – conditions for laser actions-Types–Ruby laser-He-Ne laser-applications of lasers–Raman effect–Raman shift –stokes and anti stokes lines.	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

V	DIGITAL ELECTRONICS Number systems-conversion of binary into decimal– conversion of decimal to Binary–binary addition and subtraction-Basic logic gates-AND, OR, NOT gates- NAND and NOR as an universal logic gates-Boolean Algebra–Laws of Boolean Algebra-De Morgan’s theorems- verifications using truth tables.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Meter bridge-B-H Curve-Atomic & Nuclear Physics- Fiber optics-Artificial intelligence–Electronic School books.	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Text Books

1. Murugesan R (2001), *Electricity and Magnetism*, S. Chand & Co. Pvt. Ltd, Third edition.
2. Murugesan R, Kiruthiga Sivaprasath (2017), *Modern Physics*, S. Chand & Co. Pvt.Ltd, Sixteenth Revised color edition.
3. Brijlal & Subramanian, (1995), *Electricity and Magnetism*, Ratan Prakashan Mandir.
4. Sedha R. S. (2004), *A text book of Digital Electronics*, S. Chand & Co. Pvt. Ltd, First edition.

Reference Books

1. Murugesan R, (2010), *Allied Physics Paper I and II*, S.Chand & Co, New Delhi, Revised Edition.
2. Narayanamurthi R, (1988), *Electricity and Magnetism*, The National Publishing Co, First Edition.
3. Arthur Beiser, Mahajan, Choudhury, (2015), *Concepts of Modern Physics*, Pustakkosh Publications, India.
4. Donald P. Leach, Albert Paul Malvino, Goutam Saha, (2008), *Digital principle and Applications*, Mc Graw-Hill Publishing Company, 6th Editions, New York.
5. Vijayendran V, Viswanathan S, (2004), *Digital Fundamentals*, S. Viswanathan Printers Pvt. Ltd, Revised edition.

Web References

1. <https://wepdf.com/al/allied-physics>
2. <https://archive.nptel.ac.in/courses>
3. <https://nptel.ac.in/courses>
4. <https://www.askiitians.com/revision-notes/physics/atomic-physics/>

Pedagogy

Chalk and talk, PPT, Quiz, Assignment and Group discussion

Course Designer

Dr. R. Mekala

Semester IV	Internal Marks: 25			External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS	
22UCS4AC6	MICROCONTROLLERS	SECOND ALLIED COURSE -III	4	3	

Course Objectives

- To study the basics of 8051 microcontroller
- To differentiate microprocessor and microcontroller applications.
- To gain the knowledge for programming of 8051 microcontroller
- To study the interfacing techniques of 8051microcontroller
- To design different application circuits using 8051microcontroller

Pre-requisites

- Knowledge about the concepts of microprocessors.
- Fundamental knowledge of difference between microprocessor and microcontroller.
- Basic knowledge of writing simple programs.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to	Cognitive Level
CO 1	Understand the basic principles of microcontroller based design and development	K1, K2
CO 2	Analyze the characteristics of interfacing technologies and their potential applications	K3
CO 3	Classify different kinds of programming techniques	K4
CO 4	Apply the concepts to design small microcontroller based projects	K3, K5
CO 5	Develop the idea to design and build functional prototype for real world applications	K4

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	2	3	3	3	2	3	3
CO 2	3	2	3	3	3	3	2	1	3	3
CO 3	3	3	3	3	3	3	3	1	3	3
CO 4	3	3	3	3	3	3	3	2	3	3
CO 5	3	3	3	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	MICROCONTROLLER INTEL 8051 ARCHITECTURE Introduction to microcontrollers – Comparison between microprocessor and controller – Types of microcontroller-Architecture of 8051- Internal block diagram - Pin Configuration of 8051- Internal RAM organization – External Memory Interfacing.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	INSTRUCTION SET OF 8051 Addressing Modes: Immediate- register- Direct- Indirect – Relative – Absolute - Long- Indexed-Inherent – Bit inherent - Bit direct-Instruction timings -8051 Instruction –Data Transfer- Arithmetic-Logical-Branch-Subroutine-Bit manipulation	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	PROGRAMMING OF 8051 Introduction - Assembly language program –Conversion of 8-bit binary number to its equivalent BCD – Addition of two 16-bit numbers - Subtraction of two 16- bit numbers – Finding the largest number from the given set of numbers – Arranging a set of numbers in ascending order – Finding the average of N numbers -Finding the number of positive and negative number.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	INTERRUPTS AND TIMER /COUNTER, Interrupts: Introduction to interrupt- Interrupt structure types and their vector addresses- Interrupt enable register and interrupt priority register (IE, IP) Timer / counter: TMOD –TCON- SCON- SBUF- PCON Registers- Timer modes- programming for time delay using mode 1 and mode 2.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	INTERFACING AND SERIAL COMMUNICATION Interfacing: Parallel and Serial ADC-DAC- Liquid Crystal Display - Stepper motor. Serial Communication: Synchronous and asynchronous serial communication- Use of timer to select baud rate for serial communication	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Advantages of microcontrollers- microcontroller programming using the 'C ' programming language - -Keyboard interfacing – Different types of microcontroller – Applications of microcontrollers in automobiles.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Atul P. Godse, Dr. Deepali A. Godse,(2020).*Microcontrollers* (1st Edition), Technical Publications, Pune, India.
2. Padmanabhan T.R, (2020). *Introduction to Microcontrollers and their Applications (Reprint)*, Narosa Publications, New Delhi, India.
3. Muhammad Ali Mazidi, Rolin McKinlayJanice, Gillispie Mazidi, (2007). *The 8051 Microcontrollers & Embedded Systems* (2nd edition), Pearson publications, New Delhi, India.

Reference Books

1. Uma Rao K and Andhe Pallavi, (2011).*The 8051 microcontroller – Architecture, programming and applications* (3rd edition), Pearson publications, New Delhi.
2. Rajkamal, (2011). *Microcontrollers: Architecture, Programming, Interfacing and System Design* (2nd edition), Pearson publications, New Delhi.

Web References

1. <https://www.electronicwings.com/8051/introduction-to-8051-controller>
2. <https://nptel.ac.in/courses/117104072>
3. <https://www.digimat.in/nptel/courses/video/108105102/L28.html>
4. <https://archive.nptel.ac.in/courses/108/105/108105102/>
5. https://www.bipom.com/applications/micro_interfacing.pdf

Pedagogy

Chalk and Talk, Assignment, Power Point Presentation, E-content, Group discussion and quiz.

Course Designer

Dr.D.Devi

Semester IV	Internal Marks: 25			External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS	
22UCG4AC6	MICROPROCESSOR & MICROCONTROLLERS	SECOND ALLIED COURSE-II (AC)	5	4	

Course Objectives

- To understand the architecture of 8085& 8051.
- To impart the knowledge about the instruction set.
- To develop skill in writing simple programs for 8085 and its interfacing applications.
- To acquire the knowledge and understanding of peripheral devices.

Pre-Requisites

- Basics mathematical knowledge on conversion of number system.
- A basic understanding of digital circuits.
- Fundamental ideas on Architecture and flow chart.
- Basic knowledge and understanding on programming.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Students will be able to,	Cognitive Level
CO 1	Understand the architecture and programs of 8085 and 8051	K1, K2
CO 2	Illustrate the knowledge about the instruction sets of 8085 & 8051	K1, K2
CO 3	Distinguish between 8085 and 8051 architectures and various functions	K1, K2
CO 4	Outline the functions of 8085, 8051 and peripheral devices	K2, K3
CO5	Develop skill of writing program for 8085 and 8051 based systems	K2, K3

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	2	2	2	3	2	2	2	3	3
CO 2	2	2	3	2	3	2	2	3	3	3
CO 3	2	2	2	2	3	2	2	2	3	3
CO 4	2	2	2	2	3	2	2	3	3	3
CO 5	2	2	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” – indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	MICROPROCESSOR (8085) Microprocessor evolution and types, Microprocessor architecture and operations of its components-data and address bus - pin configuration – flags - addressing modes, Interrupts, data transfer schemes, instruction and data flow - timing diagram - memory read and write – I/O read and write.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	MICROPROCESSOR INSTRUCTION SET Instruction set: data transfer, arithmetic, logic, branch operations, stack, I/O operations, control looping, counting, indexing, programming techniques, counters and time delays, stacks and subroutines, conditional call and return instructions.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	SIMPLE PROGRAMS 8- bit Addition – 8-bit Subtraction – Multiplication and Division - Decimal to HEX and HEX to Decimal conversion - Finding the largest and smallest number between two numbers - Finding the largest and smallest number in a data array- sum of a series – Ascending and descending order – 1's complement and 2's complement.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	PERIPHERAL AND INTERFACING Interfacing Devices and I/O Devices: Generation of control signals for memory and I/O devices. Peripheral Devices: 8237 DMA Controller - 8255 programmable peripheral interface - 8253/8254 programmable timer/counter - 8259 programmable interrupt controller - 8251 USART.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	MICROCONTROLLER (8051) Comparison between microprocessor and microcontroller - Features of 8051 - Architecture - Pin configuration – 8051 interrupts - Memory organization - External data and program memory - Addressing modes.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) BCD to Binary and Binary to BCD conversions –BCD to HEX and HEX to BCD conversions- BCD seven segment display- Subtraction using 1's complement and 2's complement.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Gaonkar,Ramesh S (1984). *Microprocessor Architecture, Programming and Applications with 8085*. (5th Edition) Pearson Education.
2. Ram . B , (2013). *Fundamental of Microprocessor and microcontroller*. (8th Edition) Dhanpat Rai Publications(P) Ltd, New Delhi.
3. Muhammad Ali Mazidi,Janice Gillispie Mazidi, Rolin D. McKinlay, (2005). *The 8051 Microcontroller and Embedded Systems*. (2nd Edition) Prentice Hall of India, New Delhi.

Reference Books

1. Nagoorkani A (2012). *Microprocessors & Microcontrollers*. (2nd Edition) RBA Publications, Chennai.
2. Godse.D.A, Godse.A.P, (2017) *Microprocessors and Microcontrollers*, (4th Revised Edition) Technical Publications,Pune.

Web References

1. https://www.tutorialspoint.com/microprocessor/microcontrollers_overview.htm
2. <https://www.guru99.com/difference-between-microprocessor-and-microcontroller.html>
3. <https://www.javatpoint.com/microprocessor-tutorial>
4. <https://electronicsdesk.com/8085-microprocessor.html>

Pedagogy

Chalk and Talk, Seminars, Power Point Presentation, Quiz, Assignment and Group discussion.

Course Designer

Dr.T.Noorunnisha

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCG4AC5P	DIGITAL & MICROPROCESSOR (P)	SECOND ALLIED COURSE-II (AP)	3	2

Course Objectives

- To enable the student to gain practical knowledge.
- To acquire basic understanding of laboratory techniques.
- To enhance the experimental skills.
- To understand the theory and develop practical application skills.

Pre -requisites

- Basic knowledge on usage of logic gates.
- Fundamental ideas on microprocessor.
- Understanding on Digital circuit connection.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the principles of electronics.	K1
CO2	Interpret findings using the correct physical scientific framework.	K2
CO3	Analyze working principles of logic gates.	K4
CO4	Design electronic circuits.	K5
CO5	Design program using microprocessor.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	2	1	2	3
CO2	2	3	2	3	2	3	3	2	3	3
CO3	2	3	2	3	3	3	3	3	3	3
CO4	2	3	3	3	3	3	1	3	3	2
CO5	3	3	3	3	3	3	2	3	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” – indicates there is no correlation.

Syllabus

LIST OF EXPERIMENTS (Any 8)

Digital Electronics

1. Verification of Logic gates.
2. Construction of Half adder and Half Subtractor.
3. NAND as Universal Building Block.
4. Solving Boolean expression using k-Map.
5. Excess-3 to BCD Conversion using gates
6. Construction of RS Flip Flop

Microprocessor 8085

1. 8-bit addition and 8-bit subtraction.
2. 8-bit multiplication and 8-bit division.
3. Conversion from decimal to hexadecimal.
4. Conversion from hexadecimal to decimal system.
5. Finding the largest number in a data array.
6. Find the sum of series.

Text Books

1. Ouseph, C.C., Rao, U.J., Vijayendran, V., (2016). *Practical Physics and Electronics*. S.Viswanathan, Printers & Publishers Pvt Ltd., Chennai.
2. Vijayendran.V, (2009). *Introduction to Integrated Electronics: Digital and Analog* (Revised Edition). Viswanathan S., Printers & Publishers Pvt Ltd., Chennai.
3. Ram.B, (2013). *Fundamental of Microprocessor and microcontroller* (8th Edition) Dhanpat Rai Publications(P) Ltd., New Delhi.

Reference Books

1. Anand Kumar.A, (2016). *Fundamentals of Digital Electronics*. (4th Edition). PHI Learning Pvt. Ltd., New Delhi.

Web References

1. <https://de-iitr.vlabs.ac.in/exp/truth-table-gates/simulation.html>
2. <https://de-iitr.vlabs.ac.in/exp/half-full-adder/simulation.html>
3. <http://vlabs.iitkgp.ernet.in/coa/exp13/index.html#>
4. <https://www.vlab.co.in/>
5. <https://de-iitr.vlabs.ac.in/exp/realization-of-logic-functions/theory.html>

Pedagogy

Demonstration and practical sessions.

Course Designer

Dr.A.Mary Girija

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED (IHCYCLE) WITH “A” GRADE BY NAAC

ISO9001:2015Certified

TIRUCHIRAPPALLI-18

PG & RESEARCH DEPARTMENT OF PHYSICS



M.Sc., PHYSICS SYLLABUS
(2023-2024 and Onwards)

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18.
PG & RESEARCH DEPARTMENT OF PHYSICS

VISION

To establish a substratum for excellence and creation of knowledge by igniting the essence of learning physics and exploring its area of research with novel ideas.

MISSION

Our mission is two –fold.

- To provide an outstanding and distinctive education to our undergraduate and post graduate students.
- To expand our research enterprises via centers and institutes to achieve national and international prominence in strategic research areas.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	STATEMENTS
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills In order to adapt to the changing global scenario and gain access to versatile career opportunities in multi-disciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc PHYSICS PROGRAMME

PO NO.	Programme Outcome On completion of M.Sc Physics Programme, The students will be able to
PO1	Problem Analysis: Provide opportunities to develop innovative design skills, including the ability to formulate problems, to think creatively, to synthesize information, and to communicate effectively.
PO2	Scientific Skills: Create and apply advanced techniques and tools to Solve the societal environmental issues.
PO3	Environment and sustainability: Ascertain eco-friendly approach For sustainable development and inculcate scientific temper in the society.
PO 4	Ethics: Imbibe ethical and social values aiming towards holistic Development of learners.
PO5	Lifelong learning: Instil critical thinking, communication, initiative which potentially leads to higher rates of employment and educational fulfillment.

PROGRAMME SPECIFIC OUTCOME FOR M.Sc., PHYSICS

PROGRAMME

PSO NO.	Programme Specific Outcomes Students of M.Sc Physics will be able to	Pos Addressed
PSO1	Demonstrate proficiency in the mathematical concepts needed for a proper understanding of Physics	PO1, PO2, PO5
PSO2	Understand the basic concepts of Physics particularly concepts in classical mechanics, quantum mechanics, electrodynamics and electronics to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws.	PO2, PO5
PSO3	Learn numerous numerical problem-solving approaches and the fundamentals of curve fittings.	PO1, PO2
PSO4	Learn about microprocessors and microcontrollers, as well as practical microprocessor programming abilities	PO1, PO2
PSO5	Provide with broad theoretical and practical knowledge in all specialization of Physics with required qualitative and quantitative techniques.	PO1, PO2', PO5



Cauvery College for Women (Autonomous)

PG & Research Department of Physics

M.Sc., Physics

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2023-2024 and onwards)

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course - I (CC)	Mathematical Physics	23PPH1CC1	6	5	3	25	75	100
	Core Course -II (CC)	Classical Mechanics and Relativity	23PPH1CC2	6	5	3	25	75	100
	Core Course-III (CC)	Linear and Digital ICs and Applications	23PPH1CC3	6	5	3	25	75	100
	Core Practical - I (CP)	General Physics and Electronics-I(P)	23PPH1CC1P	6	5	3	40	60	100
	Discipline Specific Elective Course-I (DSE)	Physics of Nano Science and Technology	23PPH1DSE1A	6	3	3	25	75	100
		Energy Physics	23PPH1DSE1B						
		Digital Communication	23PPH1DSE1C						
Total				30	23	-	-	-	500
INTERNSHIP will be carried out during the first semester holidays and the internship report will be evaluated and included in the second semester mark statement.									
II	Core Course -IV(CC)	ElectromagneticTheory	22PPH2CC4	6	5	3	25	75	100
	Core Course -V(CC)	Quantum Mechanics	23PPH2CC5	6	5	3	25	75	100
	Core Choice Course - I(CCC)	Microprocessor and Microcontroller	23PPH2CCC1A	6	4	3	25	75	100
		Nonlinear Dynamics	22PPH2CCC1B						
		Physics of Sensor and Transducer	23PPH2CCC1C						
	Core Practical -II (CP)	Microprocessor and Python Programming (P)	22PPH2CC2P	6	5	3	40	60	100
DisciplineSpecific Elective Course -II	Numerical Methods and Python Programming	22PPH2DSE2A							

	(DSE)	Biomechanics and Biophysics	23PPH2DSE2B	6	3	3	25	75	100
		Material Characterization and Measurement Techniques	22PPH2DSE2C						
	Internship	Internship	22PPH2INT	-	2	-	25	75	100
	Extra Credit Course	SWAYAM	As per UGC Recommendation						
	TOTAL			30	24	-	-	-	600

Semester-II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23PPH2CC5	QUANTUM MECHANICS	CC-V	6	5

Course Objectives

- To provide the basic concepts of quantum mechanics and various formalism of quantum mechanics
- To impart knowledge of advanced quantum mechanics for solving relevant physical problems
- To introduce the role of Quantum Mechanics on evolution of the physical systems in our Universe
- To deepen the understanding of the theoretical and practical principles of Quantum Mechanics
- To familiarize students with advanced quantum mechanics

Pre-requisites

- Basic understanding of mechanics.
- Knowledge of partial differential equation and variable separable method.
- Commendable knowledge on integral and differential calculus

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to	Cognitive Level
CO 1	Analyze the advanced techniques in Physics to gain insights towards quantum mechanics	K1, K2
CO 2	Apply principles of Quantum Mechanics to calculate observables for given wave functions	K3
CO 3	Apply knowledge about fundamental quantum mechanical processes in nature	K4
CO 4	Ascertain the mathematical concepts behind fundamentals of quantum mechanics.	K5
CO 5	Develop the concepts in quantum mechanics and apply the development of mathematical skills and problem solving in quantum mechanics	K6

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	3	3	2	3	3	2	2	2	3
CO 2	3	2	3	3	2	3	2	2	2	2
CO 3	2	3	2	3	3	2	2	3	2	3
CO 4	3	3	3	2	3	3	3	3	2	2
CO 5	3	3	3	3	2	3	3	3	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	SCHRÖDINGER EQUATION APPROACH Time dependent Schrödinger equation - Time independent Schrödinger equation - Normalization and probability interpretation- Expectation values: Ehrenfest theorem - Conditions on the wave function APPLICATIONS Particle in a square well potential - Quantum mechanical tunnelling - Reflection at potential barrier and walls - Linear harmonic oscillator (Schrödinger method) - The free particle - Hydrogen atom - Deuteron	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	FORMALISM IN QUANTUM MECHANICS Linear vector space - Linear operator - Eigenfunctions - Eigenvalues - Hermitian operator- Postulates of quantum mechanics - Simultaneous Measurability of Observables - General uncertainty Relation - Dirac's notation - Equation of motion - Momentum representation - Heisenberg Method - Matrix representation of Wavefunction - Matrix representation of operator - Schrodinger Equation in Matrix form- Unitary Transformations	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	SIMPLE HARMONIC OSCILLATOR Harmonic oscillator in Schrodinger representation - Properties of stationery states - Formulation of Harmonic oscillator problem in abstract notation - Eigen states and Eigenvalues of the Harmonic oscillator (Abstract operator approach) - Creation, Annihilation and Number operators ANGULAR MOMENTUM Angular momentum operator - Commutations relations of Angular momentum - Eigenvalue and eigenfunction of L^2 and L_z - Eigenvalues of J^2 and J_z - Angular momentum matrices -Spin angular momentum - Addition of angular momentum- Clebsch Gordon Coefficients	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	TIME-INDEPENDENT PERTURBATION THEORY Perturbation theory for discrete levels - Equation in various orders- Non-degenerate levels -Degenerate levels - First excited state of Hydrogen atom - Two electron atoms-Variational method: Upper bound on ground state energy - Application to excited states Hydrogen molecule - WKB approximation: One	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

	dimensional Schrödinger equation with asymptotic solution TIME-DEPENDENT PERTURBATION THEORY Introduction - First order perturbation - Harmonic Perturbation -Transition to continuum states(Fermi's Golden Rule) - Absorption and Emission of Radiation- Einstein's A and B coefficients - Selection rule			
V	SCATTERING THEORY The Born approximation - Validity of Born approximation - Partial wave analysis: Asymptotic behaviour of partial waves - Scattering amplitude in terms of phase shifts - Scattering by a square well potential- scattering by Coulomb potential RELATIVISTIC QUANTUM MECHANICS Generalization of the Schrodinger equation- Hydrogen like atom- The Klein - Gordon equation - Dirac Equation - Negative energy states - Spin of the Dirac particle - Spin Orbit Energy -The hydrogen atom	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Differential and total cross section - Scattering amplitude - Scattering amplitude in terms of Green's functions - Dirac's matrices	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Mathews.P. M. and Venkatesan K, (1987), *A Text Book of Quantum Mechanics*, Second edition Tata McGraw Hill, New Delhi.
2. Aruldas G, (2009), *Quantum Mechanics*, Second edition, Prentice Hall of India.
3. Ghatak A & Lokanathan S (1987) *A Text Book of Quantum Mechanics*, Tata McGraw Hill, New Delhi
4. Eugen Merzbacher, (1998), *Quantum Mechanics*, Third edition, John Wiley & Son, Inc, Newyork

Reference Books

1. Devanathan V, (2006), *Quantum Mechanics*, Narosa Publishing House, New Delhi,
2. Schiff L, (2014), *Quantum Mechanics*, 4th edition, Tata McGraw Hill, New Delhi,
3. Shankar R, (2007), *Principles of Quantum Mechanics*, 2nd edition, Springer, New Delhi.
4. Thankappan V.K, (2014), *Quantum Mechanics*, 4th Edition Wiley Eastern Ltd, New Delhi.

Web References

1. <https://www.britannica.com/science/quantum-mechanics-physics>
2. <https://plato.stanford.edu/entries/qm/>
3. <https://www.newscientist.com/definition/quantum-mechanics/>

Pedagogy

Chalk and Talk, Assignment, Group discussion and quiz

Course Designer

Dr.R.Meenakshi

SEMESTER-II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PPH2CCC1A	MICROPROCESSOR AND MICROCONTROLLER	CCC-I	6	4

Course Objectives

- To understand the architecture of 8085 & 8051
- To impart the knowledge about the instruction set
- To understand the interfacing circuits for various applications of 8051 microcontroller.
- To introduce the architecture of advanced microprocessors and microcontroller.
- To analyse the basic concepts and programming of 8051 microcontroller

Pre-requisites

- Knowledge about digital circuits
- Concepts of programming languages

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, students will be able to	Cognitive Level
CO 1	Understand the basics of microprocessor/microcontroller and impart the knowledge about the instruction set	K1,K2
CO 2	Demonstrate programming proficiency using the various addressing modes and data transfer instructions of microprocessor/micro controller	K3
CO 3	Explain the data transfer schemes of microprocessor/microcontroller and interfacing devices	K4
CO 4	Distinguish the instruction set of microprocessor / micro controller and Create program with microprocessor/microcontroller	K5
CO 5	Develop programming skill using interfacing and peripheral devices of microprocessor/microcontroller	K6

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	1	1	3	1	1	1	3	2	2
CO 2	2	2	1	3	1	3	3	2	2	3
CO 3	1	1	2	3	1	2	3	1	2	2
CO 4	1	1	2	3	1	3	3	3	2	3
CO 5	2	2	1	3	1	3	3	3	2	3

“1” – Slight (Low) Correlation
“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
“-” – Indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	CONGNITIVE LEVEL
I	ARCHITECTURE OF 8085 Architecture of 8085 - Data and Address buses - Registers in 8085- Addressing modes in 8085- Pin configuration of 8085-Instruction set of 8085-Instruction types (based on number of bytes, operation) data transfer - Arithmetic - Logical- Branching- Stack and I/O instructions - Instruction cycles - Fetch operation - Execute operation - Machine cycle and State - Instruction and data flow - Timing diagram - Memory read and memory write cycles.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	MICROPROCESSOR PROGRAMING Assembly language - Stacks - Subroutines. Simple programs: Addition and subtraction two 8-bit and 16-bit numbers – Shift an 8-bit number left by one bit- Mask off Least Significant 4 bitsof an 8-bit number-Find the largest and smallest number in a data array – Sum of a series - Multiplication- Division - Multi-byte addition and subtraction.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	DATA TRANSFER SCHEMES AND INTERFACING AND PERIPHERAL DEVICES Programmed data transfer scheme- Synchronous and Asynchronous and serial data transfer schemes- Interfacing devices- Types of interfacing devices- Programmable Peripheral Interface (PPI- 8255)- Communication interfacing device (Universal Synchronous Asynchronous Receiver Transmitter (USART- 8251))- Programmable DMA controller (8257) –Programmable Interrupt Controller (PIC 8259) – Special Purpose Interfacing Devices – Programmable CRT Controller (8275H) – Programmable Keyboard / Display Interface (8279)	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	MICROCONTROLLER-8051 Introduction to micro controller- Difference between microprocessor and microcontroller. 8051 microcontroller: Pin configuration- Architecture and Key features 8051- Data types and directives Instruction set: Data transferinstructions - Arithmetic instructions – Logical instructions- Branching instructions- Addressing modes - Simple programs – Addition and subtraction of two 8-bit numbers – Multiplication- Division -Largest Number in an array – Conversion of 8 –bit number to BCD	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

V	MICROPROCESSOR AND MICROCONTROLLER APPLICATIONS Microprocessor Applications: Interfacing 7 segment LED display-Measurement of temperature-Microprocessor based traffic control. Microcontroller Applications: Temperature controller – Stepper motor.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF STUDY FOR ENRICHMENT (Not included for End Semester Examination) Assembly language Programs using Microprocessor - Decimal to Hexadecimal Conversion - Ascending and Descending order- Shift an 8-bit number left by 2 bit - Shift a 16-bit number left by one bit - Shift a 16-bit number left by 2 bit - Mask off Most Significant 4 bits of an 8-bit number.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Ram B. (2013) *Fundamental of Microprocessor and Microcontroller*. Dhanpat Rai Publications(P) Ltd, New Delhi.8th Edition
2. Godse A. P Godse D.A. (2017) *Microprocessors and microcontrollers*. Technical Publications, Pune 4th Revised Edition

Reference Books

1. uhammad Ali Mazidi, Jinice Gillispie Mazidi (2004) *The 8051 microcontroller and embedded systems*. Pearson Education, Delhi.2nd Edition.
2. Nagoorkani A. (2012) *Microprocessors & Microcontrollers*. RBA Publications, Chennai.2nd Edition.

Web References

1. http://nptel.ac.in/noc20_ee42
2. <http://classcentral.com/course/swayam-micropocessor-an-interfacing-17694>.
3. https://kanchiuniv.ac.in/coursematerials/VIJAYARAGHAVAN_mp%20_mc

Pedagogy

Chalk and Talk, Seminar, Assignment, Power point Presentation, Group discussion and Quiz

Course Designer

Dr.T.Noorunnisha

SEMESTER-II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23PPH2CCC1C	PHYSICS OF SENSOR AND TRANSDUCER	CCC-I	6	4

Course Objectives

- To provide the knowledge of Sensing and transducer devices.
- To understand the structural and functional principles of sensors and transducers.
- To make familiar with the working of different types of sensors and transducers.
- To differentiate between the types of transducers available
- To gain information about the function of sensor and transducers.

Pre-requisites

- Fundamental knowledge of physical parameters.
- Basic idea of Sensing devices and transducers.

Course Outcome and Cognitive Level Mapping

CO Number	CO statement On the successful completion of the course, students will be able to	Cognitive Level
CO 1	Remember and understand the primary idea in sensor and transducers in instrumentation.	K1, K2
CO 2	Analyze the different types of semiconductor sensors	K3
CO 3	Evaluate the working principles of sensor and transducers for measurement of displacement, strain, velocity, acceleration etc.	K4
CO 4	Apply the function of the sensor, transducer construction, principle of operation and characteristics in proper applications.	K5
CO 5	Determine the technologies in sensing and transducing devices.	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	2	1	3	3	2	2	2	2
CO 2	3	3	2	1	3	3	2	2	2	2
CO 3	3	3	2	1	3	3	2	2	2	2
CO 4	3	3	2	1	3	3	2	2	2	2
CO 5	3	3	2	1	3	3	2	2	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation

“-” – indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIV ELEVEL
I	SENSOR BASICS Introduction-Mechanical-Electronic Transitions in Sensing- Nature of Sensors-Difference between sensor, transmitter and transducer-Primary measuring elements - Selection and characteristics: Range; resolution, Sensitivity, error, repeatability and linearity.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	SEMICONDUCTOR SENSOR Introduction-Sensor Output Characteristics- Wheatstone's Bridge- Piezo resistivity in Silicon-Semiconductor Strain Gauges - Inductive Sensors: Sensitivity and Linearity of the Sensor –Types-Capacitive Sensors: Electrostatic Transducer - Force/Stress Sensors Using Quartz Resonators - Ultrasonic Sensors	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	SENSING TECHNOLOGIES Capacitive Sensing- Piezoelectric Sensing- Hall Effect- Chemical Sensors- Improving Sensor Characteristics- Digital Output Sensors- Incremental Optical Encoders- Digital Techniques- Noise/Interference Aspects- Analysis of Sensitivity Improvement- Thin Diaphragm- Increased Diaphragm Area.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	INDUCTIVE & CAPACITIVE TRANSDUCER INDUCTIVE TRANSDUCERS Principle of operation- construction details-characteristics and Applications of LVDT Induction potentiometer-variable reluctance transducer. CAPACITIVE TRANSDUCERS Principle of operation-construction details-characteristics of Capacitive transducers – different types & signal conditioning. Applications: capacitor Microphone-capacitive pressure sensor.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	TEMPERATURE SENSORS AND THERMAL TRANSDUCERS Heat and temperature, The bimetallic strip, Liquid and gas expansion, Thermocouples, Metal – resistance sensors, Thermistors, Radiant heat energy sensing, Pyroelectric detectors, Thermal transducers, Thermal to electrical transducers.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	SELFSTUDY FOR ENRICHMENT: (Not to be included for External Examination) Characteristics - Static characteristics - Dynamic characteristics Chemical / biological characterization - Thermal Sensors Recent- Trends in Sensor Technologies	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Patranabis. D, *Sensors and Transducers*, Wheeler publisher.
2. Randy Frank, (1995) *Understanding Smart Sensor*, Artech House Boston, London. Second edition
3. Usher. M. J and Keating. D. A (1996) *Sensors and Transducers Characteristics, Applications, Instrumentation, Interfacing*, Macmillan Press Ltd. Second edition
4. DVS Murthy (2013) *Transducers and Instrumentation*, PHI 2nd Edition

Reference Books

1. Arun K. Ghosh (2012) *Introduction to measurements and Instrumentation*, PHI, 4th Edition.
2. Helfrick. A. D and Cooper W.D, (2001) *Modern Electronic Instrumentation& Measurement Techniques*, PHI.
3. Hermann K.P. Neubert (2012), *Instrument Transducers*, 2nd Edition, Oxford University Press.

Web References

1. <https://www.geeksforgeeks.org/difference-between-sensor-and-actuator/>
2. <https://www.variohm.com/news-media/technical-blog-archive/difference-between-a-sensor-and-a-transducer>

Pedagogy

Lecture, Seminar, Assignment and Power Point Presentation

Course Designer

Dr. K. KANNAGI

SEMESTER - II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23PPH2DSE2B	BIOMECHANICS AND BIOPHYSICS	DSE - II	6	3

Course Objectives

- To give exposure and orientation of different aspects of biophysics
- To impart the knowledge about the links between physical and biological sciences
- To understand the applications of physics, chemistry to biological sciences
- To provide knowledge about bioenergetics.
- To gain keen understanding of Biomolecular mechanics.

Pre-requisites

- Strong foundation of biophysics
- Commendable Knowledge of macromolecular mechanics

Course Outcome and Cognitive Level Mapping

CO Number	CO statement On the successful completion of the course, students will be able to	Cognitive level
CO 1	Remember and understand the fundamentals of Atomic & Molecular structures and thermodynamics	K1, K2
CO 2	Analyze the principles of physical sciences to understand and solve biological complexities	K3
CO 3	Recognize the biomechanics of human body.	K4
CO 4	Apply the concepts of dynamics to analysis the metabolism of human body.	K5
CO 5	Evaluate the intramolecular processes and interactions.	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	2	1	3	3	2	2	2	2
CO 2	3	3	2	1	3	3	2	2	2	2
CO 3	3	3	2	1	3	3	2	2	2	2
CO 4	3	3	2	1	3	3	2	2	2	2
CO 5	3	3	2	1	3	3	2	2	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation

“-” – indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	ATOMIC & MOLECULAR STRUCTURES Structure of Atom - Schrodinger's theory - Quantum numbers- Pauli's exclusion principle - Hund's rule - Bonds between atom & molecules – Ionic – Covalent – Hydrogen-Electrostatic – Disulphide & Peptide bonds - Vander Waals forces - Bond energies - Bond angles - Bayer's strain - Weak interactions	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
II	THERMODYNAMICS & BIOENERGETICS Laws of Thermodynamics - Concept of free energy- Unavailable energy & Entropy, change in entropy of living system - Heat content of food - Bomb calorimeter- Energy generation & energy transfer processes in biochemical reactions - Metabolism of glucose & formation of ATP - Energy requirements in cell metabolism - Role & Structure of mitochondria - High-energy phosphate bond.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
III	MOLECULAR ALPHABETS OF LIFE Amino acid - Nucleic acid bases & Lipids - Classification & Properties of Amino acid - Peptides & Polypeptides- Nucleosides - Nucleotides - Polynucleotides - Pentose & Hexose Polysaccharides - Amino acid to Peptides- Polypeptides.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
IV	PRINCIPLES OF PROTEINS Basics aspects of protein structure - Polypeptide chain geometrics - estimates of potential energy - results of potential energy calculations - hydrogen bonding - hydrophobic & hydrophilic interactions and water as universal solvent in biological systems - Disruption of hydrophobic interactions by urea - ionic interactions - hydrophobic versus ionic interactions - prediction of protein structure.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
V	MACROMOLECULAR MECHANICS Ligand interaction at equilibrium - Identical independent sites - Scatchard plot - Multiple classes of independent sites - Interaction between binding sites – Allosterism- MWC model - Sequential model - Oxygen Hemoglobin binding - Binding of two different ligands - Energetics and dynamics of binding - Structures of protein - ligand complexes	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Molecular orbital theories, Hybridization of orbitals, σ and π bonds - Electron transfer phenomenon & biological energy transfer - Different types of linkages - Concept of protein evolution, Cytochrome & Hemoglobin evolutionary studies - Free radicals in biology and medicine.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.

Text Books:

1. Ackerman E.A. Ellis, L.E.E. & Williams L.E. (1979), *Biophysical Science*, Prentice-Hall Inc.
2. Barrow. C. (1974), *Physical Chemistry for Life Sciences*, McGraw-Hill.
3. Berns M.W. (1982), *Cells*, Holt Sounders International Editors.
4. Bloomfield V.A. and Harrington R.E. (1975), *Biophysical chemistry*, W.A.Freeman and CO.
5. Bulter I.A.V. And Noble D.Eds. (1976), *Progress in Biophysics and Molecular Biology*, Oxford.
6. Cantor C.R. and Schimmel P.R. (1980), *Biophysical chemistry*, W.A.Fremman and Co.
7. Casey E.J. (1967), *Biophysics, concepts and mechanisms*, Affiliated East west press.

Reference Books:

1. Schule G.E. and schirmer R.H. (1984), *Principles of protein structure*, Springer-Verlag.
2. Segel F.H. (1975), *Enzyme Kinetics*, John willey and sons.
3. Setlow R.B. and pollard E.L. (1962), *Molecular Biophysics*, Pergamon Press.
4. Sheelk P. and Birch D.E. (1983), *Cell Biology Structure, Biochemistry and function*, John willey and sons.
5. Spragg S.E. (1980), *Physical Behavior of macromolecules with biological functions*, John willey and sons.

Web References

1. <https://www.studocu.com/in/document/gujarattechnologicaluniversity/engineering-chemistry/engineering-chemistry-atomic-and- molecular-structure/20534347>.
2. <https://www.studocu.com/in/document/university-ofcalcutta/chemistry/chemical-thermodynamics-energetics-i-notes/27031492>.
3. [https://chem.libretexts.org/Bookshelves/BiologicalChemistry/ConceptsinBiophysicalChemistry\(Tokmakoff\)/02%3AMacromolecules/09%3AMacromolecularMechanics](https://chem.libretexts.org/Bookshelves/BiologicalChemistry/ConceptsinBiophysicalChemistry(Tokmakoff)/02%3AMacromolecules/09%3AMacromolecularMechanics)

Pedagogy

Lecture, Seminar, Assignments and Power Point Presentation

Course Designer

Dr.K.KANNAGI

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED (IHCYCLE) WITH “A” GRADE BY NAAC

ISO9001:2015Certified

TIRUCHIRAPPALLI-18

PG & RESEARCH DEPARTMENT OF PHYSICS



M.Sc., PHYSICS SYLLABUS
(2022-2023 Onwards)

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18.
PG & RESEARCH DEPARTMENT OF PHYSICS

VISION

To establish a substratum for excellence and creation of knowledge by igniting the essence of learning physics and exploring its area of research with novel ideas.

MISSION

Our mission is two –fold.

- To provide an outstanding and distinctive education to our undergraduate and post graduate students.
- To expand our research enterprises via centers and institutes to achieve national and international prominence in strategic research areas.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	STATEMENTS
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills In order to adapt to the changing global scenario and gain access to versatile career opportunities in multi-disciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc PHYSICS PROGRAMME

PO NO.	Programme Outcome On completion of M.Sc Physics Programme, The students will be able to
PO1	Problem Analysis: Provide opportunities to develop innovative design skills, including the ability to formulate problems, to think creatively, to synthesize information, and to communicate effectively.
PO2	Scientific Skills: Create and apply advanced techniques and tools to Solve the societal environmental issues.
PO3	Environment and sustainability: Ascertain eco-friendly approach For sustainable development and inculcate scientific temper in the society.
PO 4	Ethics: Imbibe ethical and social values aiming towards holistic Development of learners.
PO5	Lifelong learning: Instil critical thinking, communication, initiative which potentially leads to higher rates of employment and educational fulfillment.

PROGRAMME SPECIFIC OUTCOME FOR M.Sc., PHYSICS

PROGRAMME

PSO NO.	Programme Specific Outcomes Students of M.Sc Physics will be able to	Pos Addressed
PSO1	Demonstrate proficiency in the mathematical concepts needed for a proper understanding of Physics	PO1, PO2, PO5
PSO2	Understand the basic concepts of Physics particularly concepts in classical mechanics, quantum mechanics, electrodynamics and electronics to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws.	PO2, PO5
PSO3	Learn numerous numerical problem-solving approaches and the fundamentals of curve fittings.	PO1, PO2
PSO4	Learn about microprocessors and microcontrollers, as well as practical microprocessor programming abilities	PO1, PO2
PSO5	Provide with broad theoretical and practical knowledge in all specialization of Physics with required qualitative and quantitative techniques.	PO1, PO2', PO5



Cauvery College for Women (Autonomous) PG & Research Department of Physics
M.Sc., Physics
LEARNING OUT COMES BASED CURRICULUM FRAMEWORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester	Course	Course Title	Course Code	Inst. Hrs./ week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course–I(CC)	Mathematical Physics	22PPH1CC1	6	5	3	25	75	100
	Core Course– II(CC)	Classical Dynamics and Relativity	22PPH1CC2	6	5	3	25	75	100
	Core Course –III(CC)	Quantum Mechanics-I	22PPH1CC3	6	5	3	25	75	100
	Core Practical-I (CP)	General Physics and Electronics-I(P)	22PPH1CC1P	6	5	3	40	60	100
	Discipline Specific Elective Course-I(DSE)	Microprocessor and Microcontroller	22PPH1DSE1A	6	3	3	25	75	100
		Non–Destructive Evaluation Techniques	22PPH1DSE1B						
		Astrophysics	22PPH1DSE1C						
Total				30	23	-	-	-	500
	15 Days INTERNSHIP during Semester Holidays								
II	Core Course–IV(CC)	Electromagnetic Theory	22PPH2CC4	6	5	3	25	75	100
	Core Course– V(CC)	Quantum Mechanics-II	22PPH2CC5	6	5	3	25	75	100
	Core Choice Course– I(CCC)	Electronics	22PPH2CCC1A	6	4	3	25	75	100
		Nonlinear Dynamics	22PPH2CCC1B						
		Spectroscopy	22PPH2CCC1C						
	Core Practical-II(CP)	Microprocessor and Python Programming (P)	22PPH2CC2P	6	5	3	40	60	100
	Discipline Specific Elective Course-II(DS	Numerical Methods and Python Programming	22PPH2DSE2A	6	3	3	25	75	100
		Physics of Sensor and Transducer	22PPH2DSE2B						
		Material Characterization and Measurement Techniques	22PPH2DSE2C						
	Internship	Internship	22PPH2INT	-	2	-	25	75	100
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total				30	24	-	-	-	600

III	Core Course–VI(CC)	Statistical Mechanics	22PPH3CC6	6	5	3	25	75	100
	Core Course – VII(CC)	Solid State Physics	22PPH3CC7	5	5	3	25	75	100
	Core Choice Course–II(CCC)	Cyber Security	22PGCS3CCC2A	3T + 2P	4	3	25	75	100
		Communication Electronics	22PPH3CCC2B	5					
		Physics of Semiconductor Devices	22PPH3CCC2C						
	Core Practical-III(CP)	General Physics and Electronics-II(P)	22PPH3CC3P	6	5	3	40	60	100
	Discipline Specific Elective Course-III(DSE)	Physics for Competitive Examinations	22PPH3DSE3A	5	3	2	-	100	100
		Crystal Growth and Thin Film Physics	22PPH3DSE3B			3	25	75	
		Weather Forecasting	22PPH3DSE3C			3	25	75	
	Generic Elective Course –I (GEC)	Science of Materials	22PPH3GEC1	3	2	3	25	75	100
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total				30	24	-	-	-	600
IV	Core course – VIII(CC)	Nuclear and Particle Physics	22PPH4CC8	6	5	3	25	75	100
	Core Choice Course - III(CCC)	Advanced Optics and Spectroscopy	22PPH4CCC3A	6	4	3	25	75	100
		Nanophysics	22PPH4CCC3B						
		Space Physics	22PPH4CCC3C						
	Core Practical -IV(CP)	Electronics (P)	22PPH4CC4P	6	5	3	40	60	100
	Generic Elective Course -II (GEC)	Trouble Shooting and Repairing Domestic Appliances	22PPH4GEC2	3	2	3	25	75	100
	Project	Project Work	22PPH4PW	9	5	-	-	100	100
Total				30	21	-	-	-	500
	Grand Total			120	92				2200

Semester - IV	Internal Marks: 25			External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT S	
22PPH4CC8	NUCLEAR AND PARTICLE PHYSICS	CC - VIII	6	5	

Course Objectives

- To demonstrate knowledge and understanding of the fundamental concepts of nuclear physics.
- To learn the concepts of nuclear models and nuclear force.
- To apply the role of nuclear fission in power production.
- To expose the students to the applications of nuclear reaction.
- To analyse the elementary particles according to quantum numbers.

Pre-requisites

- Knowledge about the concepts of nuclear model.
- Fundamental knowledge of currents in a network of conductors.
- Basic concept of radioactivity.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to	Cognitive Level
CO 1	Understand the properties and stability of nucleus, nuclear models and nuclear forces	K1, K2
CO 2	Apply the concept nuclear theory and analyze the construction of nuclear reactors.	K3
CO 3	Analyze the theory and applications of various radioactive decays	K4
CO 4	Analyze the elementary constituents of a nucleon based on several theories.	K4
CO 5	Evaluate the energy released during nuclear fission and fusion reactions	K5

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	2	3	3	3	2	2	2	2	2
CO 2	2	3	3	3	3	2	2	2	2	2
CO 3	3	3	3	3	3	3	3	2	2	2
CO 4	3	3	3	3	3	3	3	3	2	2
CO 5	3	3	3	3	3	3	3	3	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” – indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	BASIC PROPERTIES OF NUCLEUS Basic nuclear properties: Size, Shape, Charge distribution, Mass, Spin, Parity and Magnetic moment - Binding energy - Nuclear force - Exchange force - Yukawa's meson theory - Ground state of deuteron - Scattering ideas - Low energy n-p scattering - Phase shift - Scattering length - Spin dependence and charge independence of nuclear forces	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	NUCLEAR DECAY AND RADIOACTIVITY Theory of alpha disintegration- Geiger- Nuttal law - Gamow theory - Neutrino hypothesis - Fermi theory of beta decay -Sargent diagram - Orbital electron capture-non conservation of -Parity - Double beta decay - Gamma ray spectra and nuclear energy level - Radio active transition in nuclei - Nuclear isomerism - Internal conversion - Gamma ray spectroscopy - Mossbauer effect- Interaction of charged particles and X-rays with matter - Types and basic principles of particle detectors.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	NUCLEAR REACTIONS AND NUCLEAR MODELS Types of nuclear reactions - Conservation laws - reaction energetics – Q value - Threshold energy- nuclear reaction cross section - Level width - Compound nuclear theory - Reciprocity theorem - Breit-Wigner formula - Resonance theory -Semi empirical mass formula - Liquid drop model - Shell model - Evidences for shell model - Magic numbers - Collective model of a nucleus.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	FISSION AND FUSION REACTORS Characteristics of fission - Mass distribution of fragments - Radioactive decay processes - Fission cross-section - Energy in fission - Bohr - Wheeler's theory of nuclear fission - Fission reactors - Thermal reactors - Homogeneous reactors - Heterogeneous reactors - Basic fusion processes - Characteristics of fusion - Solar fusion - Controlled fusion reactors.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	ELEMENTARY PARTICLES Types of interactions and classification of elementary particles - Quantum numbers (Charge, Spin, Parity, isospin, Strangeness, Hypercharge) - Gell-Mann - Nishijima formula - Baryons - Leptons - Invariance principle and symmetries - Invariance under charge, parity, time reversal (CPT) - Quark model - SU(2) and SU(3) symmetry - Types of quarks and their quantum numbers.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	SELF STUDY FOR ENRICHMENT (Not to be included for End Semester Examination) Repulsion at short distances - Disposal of nuclear wastes - Theory of Stripping and pick-up reactions - evolution and life cycle of a star - Gell-Mann and Okubo mass formula.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. D.C Tayal(2011), *Nuclear physics*(2nd edition), Himalaya Publishing House, New Delhi.
2. S.N. Ghoshal(2003), *Nuclear Physics*(2nd edition), S. Chand and Co., New Delhi.
3. V. Devanathan(2008), *Nuclear Physics*(2nd edition), Narosa publishing house, New Delhi.

Reference Books

1. Arthur Beiser, Shobit Mahajan and S Rai Choudhury (2017), *Concepts of Modern Physics*(7th edition),, Tata McGraw Hill.
2. R.R. Roy and B.P. Nigam(2014), *Nuclear Physics theory and experiment*(2nd edition), New Age International, NewDelhi

Web References

1. <https://ocw.mit.edu/courses/8-701-introduction-to-nuclear-and-particle-physics-fall-2020/>
2. <https://nptel.ac.in/courses/115103101>
3. <https://www.classcentral.com/course/swayam-nuclear-and-particle-physics-9873>
4. <https://www.coursera.org/courses?query=nuclear>

Pedagogy

Chalk and Talk, Assignment, Group discussion and quiz

Course Designer

Dr.R.Gayathri

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH4CCC3A	ADVANCED OPTICS AND SPECTROSCOPY	CCC - III	6	4

Course Objectives

- To understand the light-matter interaction in nonlinear regime.
- To develop the underlying concepts from the perspectives of classical electrodynamics and advanced quantum mechanics.
- To acquire knowledge on harmonic generation and their applications.
- To understand the principles and theory of different spectroscopic method.
- To procure knowledge on advanced level spectroscopic techniques.

Pre-requisites

- Knowledge about the basic concepts of electromagnetic radiation.
- Fundamental knowledge of the different properties of light waves and atomic spectra.
- Basic knowledge of quantum mechanics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to	Cognitive Level
CO 1	Understand and explain the fundamental concepts and applications of spectroscopic methods.	K1, K2
CO 3	Illustrate nonlinear phenomena from the fundamental perspective of quantum mechanics.	K2
CO 4	Examine a detailed physical and mathematical understanding of a variety of systems and processes in a range of advanced topics in optics.	K4
CO 2	Apply the knowledge acquired and use spectroscopic instruments to examine and develop new materials.	K3
CO 5	Appraise the ability to perform research and development projects using advanced theoretical and experimental skills and tools.	K5

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	2	2	2	2	3	3	2	2	2
CO 2	2	1	2	2	2	3	3	2	2	2
CO 3	3	2	3	3	2	2	3	3	2	2
CO 4	3	3	3	3	3	2	2	3	3	2
CO 5	3	3	3	3	3	3	2	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	THE NONLINEAR OPTICAL SUSCEPTIBILITY: Introduction to Nonlinear Optics – Description of Nonlinear Optical Processes –Definition of the Nonlinear susceptibility – Properties of the nonlinear susceptibility – Time-Domain description of optical nonlinearities - The wave equation for nonlinear optical media – The coupled-wave equation for Sum- Frequency generation	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	SECOND-ORDER OPTICAL NONLINEARITIES: Phase matching – Quasi-phase-matching – The Manley-Rowe relations – Sum-Frequency generation -Second-harmonic generation –Difference-frequency generation and parametric amplification – Nonlinear optical interactions with focused Gaussian beams.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	MICROWAVE SPECTROSCOPY: Rotation of molecules-Rotational spectra - Rigid and non-rigid diatomic rotator-Intensities of spectral lines- Effect of Isotopic substitution-Polyatomic molecules (Linear, symmetric top and asymmetric top)-Chemical analysis by microwave spectroscopy- Techniques and instrumentation- microwave oven.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	INFRARED SPECTROSCOPY: Vibration of Diatomic molecules-Simple Harmonic Oscillator- Anharmonic oscillator-Diatomic vibrating rotator- The vibration-rotation spectrum-Interactions of rotations and vibrations-The vibrations of polyatomic molecules-Influence of rotation on the Vibrational spectra of linear and symmetric top molecules-Analysis by infrared techniques-Instrumentation-FTIR spectroscopy.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	RAMAN SPECTROSCOPY: Classical and quantum mechanical picture of Raman effect - Polarizability-Pure rotational Raman spectra- Vibrational Raman Spectra-Raman activity of vibrations of CO ₂ and H ₂ O-Rule of mutual exclusion-Overtone and combination vibrations- Rotational fine structure -Vibrations of spherical top molecule-structure determination from Raman and IR spectroscopy-techniques and instrumentation-FT Raman spectroscopy - Surfaces for SERS study-SERS microbes Surface selection rules.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Application of FTIR Spectroscopy- Atomic emission Spectroscopy - Difference between atomic absorption spectra and atomic emission spectra - Numerical estimate of nonlinear optical quantities - Applications of second harmonic generation	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Robert W Boyd, (2015). *Nonlinear Optics* (3rd edition), Academic Press, United States.
2. Murti Y V G S, Vijayan C, (2021). *Physics of Nonlinear Optics* (2nd edition), Springer Nature, Switzerland.
3. Banwell C.N and Mc Cash E.M, (2013), *Fundamentals of Molecular Spectroscopy*, (4th edition), Tata Mc Graw-Hill, New Delhi.
4. Aruldhas G, (2008), *Molecular structure and spectroscopy*, Prentice Hall of India Pvt. Ltd., New Delhi
5. Sindhu P S, (2006), *Fundamentals of Molecular Spectroscopy*, (4th edition), New Age International Publishers, New Delhi.

Reference Books

1. Shanmuganathan Rajasekar, Juan C Vallejo, (2016). *Nonlinear Resonances* (1st edition), Springer International Publishing
2. Guo Y, Kao C K, Li E H, Chiang K S, (2002). *Nonlinear Photonics* (1st edition), Springer.
3. Shen Y R, (2002). *Principles of Nonlinear Optics* (1st edition), Wiley Interscience.
4. Kaur H, (2009), *Spectroscopy*, (5th edition), A Pragati Prakashan, Uttarpradesh, India
5. Engel T. (2015), *Quantum Chemistry and Spectroscopy*, (3rd edition), Pearson, New York.

Web References

1. <http://www.soest.hawaii.edu/HIGP/Faculty/sksharma/GG711/GG711Spectroscopy03Vibrational.pdf>
2. <https://archive.nptel.ac.in/courses/104/108/104108078/>
3. https://mpl.mpg.de/fileadmin/user_upload/Chekhova_Research_Group/Lecture_4_8.pdf
4. <http://jonsson.eu/research/lectures/lect8/web/>
5. https://www.rp-photonics.com/frequency_doubling.html

Pedagogy

Chalk and Talk, Assignment, Power Point Presentation, E-content, Group discussion and quiz.

Course Designer

1. Dr.G.Maheswari
2. Dr.D.Devi

Semester- IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH4CCC3B	NANOPHYSICS	CCC-III	6	4

Course Objectives

- To introduce the fundamentals of nanoscale systems and various dimensionality of matters and structures
- To understand the carbon nanostructures and their properties.
- To learn the structures and properties of nanomaterials.
- To get a qualitative idea on the top-down and bottom-up approach of preparing nanomaterials.
- To study the fundamental concepts of energy conversion systems and different energy storage methods.

Pre-Requisites

- Basic knowledge in Solid State Physics.
- Fundamental ideas about the various dimensionality of matters and structures.
- Able to develop the idea on the working of storage devices.

Course Outcome

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to,	Cognitive Level
CO 1	Understand the basic of nanoscience, nanostructures and explore the different types of nanomaterials that should comprehend the surface effects of the nanomaterials.	K1, K2
CO 2	Understand the process of nanomaterials, formation of carbon nanostructures, fabrication of nanomaterials with their characterization techniques.	K2
CO 3	Apply the concepts on classification of nanomaterials, properties of nanostructures, synthesis techniques using physical, chemical approaches and the structural, microscopic effects of the nano-products with its application in energy conversions.	K3
CO 4	Analyze the quantum confinement, properties of the nano-products, various characterization techniques and applications in storage devices.	K4
CO 5	Analyze the concepts of nanoscience and technology, the structure of C60, the process and mechanism of synthesis, the spectroscopic characterization techniques and in the field of solar cells, batteries. .	K4, K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO 1	2	3	3	3	3	3	3	3	3	3
CO 2	2	3	3	3	3	3	3	3	3	3
CO 3	2	3	3	3	3	3	2	3	3	3
CO 4	2	3	3	2	3	3	2	3	3	3
CO 5	2	3	3	2	3	3	2	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” - indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	INTRODUCTION TO NANOMATERIALS Fundamentals of NANO-Historical Perspective on Nanomaterial and Nanotechnology-Classification of Nanomaterials-Metal and Semiconductor Nanomaterials-2D, 1D, 0D nanostructured materials-Quantum dots-Quantum wire-Quantum well-Surface effects of nanomaterials	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	CARBON NANOSTRUCTURES AND PROPERTIES Carbon molecules-Carbon bond-C ₆₀ : Discovery and structure of C ₆₀ and its crystal-Superconductivity in C ₆₀ -Carbon Nanotube-Fabrication-Structure-Electrical Properties-Vibrational Properties-Mechanical Properties	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	SYNTHESIS OF NANOMATERIALS Top down and Bottom-up approach Physical Method: High energy ball milling-Laser Ablation- Molecular Beam Epitaxy (MBE). Chemical Methods: Sol-Gel method-Solvothermal Synthesis-Hydrothermal Synthesis-Sonochemical Synthesis-Microwave Synthesis-Co-Precipitation	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	CHARACTERIZATION OF NANOMATERIALS Structural Characterization: Powder X-ray	18	CO1 CO2 CO3	K1 K2 K3

	diffractometer-FTIR spectrometer. Microscopic Analysis: Scanning Electron Microscopy (SEM), Energy Dispersive x-ray spectroscopy (EDS), Transmission Electron Microscopy (TEM). Optical Analysis: UV–Visible spectrophotometer		C04 C05	K4 K5
V	NANOTECHNOLOGY FOR ENERGY CONVERSION AND STORAGE DEVICES Photovoltaic Systems: Principles of photovoltaic energy conversion (PV)-Types of photovoltaic cells-Physics of photovoltaic cells-Organic photovoltaic cells-Sensitized Solar Cells (SSC). Energy Storage System-Batteries: Energy Storage Devices-Primary and Secondary Batteries (Lithium-ion Batteries)	18	C01 C02 C03 C04 C05	K1 K2 K3 K4 K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) MXenes-Nano Electro Mechanical systems (NEMs)-Physical properties of Nanomaterials: Melting points, specific heat capacity, and lattice constant- Chemical Vapour Deposition (CVD)- Photoluminescence, Raman- Electrochemical sensors – Nano-biosensors- Rechargeable batteries.	-	C01 C02 C03 C04 C05	K1 K2 K3 K4 K5

Text Books

1. Pradeep T, (2012), *A textbook of Nanoscience and Nanotechnology*, Tata McGraw-Hill Publishing Co.
2. Shah M. A. & Ahmad, T. (2010), *Principles of nanoscience and nanotechnology*, Narosa Publishing House Pvt Ltd.
3. Poole C. P. and Owens F. J. (2003), *Introduction to Nanotechnology*, Wiley Reprint (2014).
4. Mick Wilson, Kamali Kannangara, Geoff Smith, Michelle Simmons, Burkhard Raguse, (2005), *Nanotechnology: Basic Science and Emerging Technologies*, Overseas Press.
5. Brabec C, Dyakonov V, Scherf U, (2014), *Organic Photovoltaics: Materials, Device Physics, and Manufacturing Technology*, 2nd Edition, Wiley VCH.
6. Conway B E, (1999), *Electrochemical supercapacitors: Scientific Fundamentals and Technological Applications*, Kluwer Academic Plenum publisher, New York.
7. Linden D. Thomas Reddy B, (2002), *Handbook of Batteries*, 3rd Edition, McGraw-Hill, New York.

Reference Books

1. Rao M. S. R. & Singh, S. (2017), *Nanoscience and nanotechnology: Fundamentals to frontiers*. Wiley Publishing.
2. Booker R. & Boysen, E. (2005), *Nanotechnology*, Wiley Publishing Inc.
3. Fendler J. H. (2007), *Nanoparticles and nanostructured films: Preparation, Characterization and Applications*, John Wiley and Sons.
4. Murty, B. S. et al. (2012), *Textbook of Nanoscience and Nanotechnology*, Universities Press.
5. Diwan P. & Bharadwaj, A. (2005), *The Nanoscope (Encyclopedia of nanoscience and nanotechnology)*, Vol. IV – Nanoelectronics. Pentagon Press.
6. C. Brabec, V. Dyakonov, U. Scherf, *Organic Photovoltaics: Materials, Device Physics, and Manufacturing Technology*, 2nd Edition, Wiley VCH, (2014).
7. Manthiram A, (2000), *Science and Technology of Lithium Batteries-Materials Aspects: An Overview*, Kulwer Academic Publisher.

Web References

1. <https://nptel.ac.in/courses/118/102/118102003/>
2. <https://www.classcentral.com/course/swayam-structural-analysis-of-nanomaterials-14310>
3. <https://nptel.ac.in/courses/113/107/113107081/>
4. <https://nptel.ac.in/courses/112/107/112107283/>

Pedagogy

Chalk and talk, PPT, Expert Lectures, Online Seminars, Quiz, Assignment and Group discussion.

Course Designer

Dr. R. MEKALA

SEMESTER - IV	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT
22PPH4CCC3C	SPACE PHYSICS	CCC - III	6	4

Objectives

- To develop the underlying concepts of the solar system and planetary atmospheres.
- To understand the solar wind interaction with planets.
- To study the concepts of energy deposition techniques.
- To understand the quantitative behavior of different space physics phenomena using various analysis methods.
- To acquire knowledge about absorption in stellar atmospheres.

Pre-requisites

- Basic Knowledge about the Planetary System
- Fundamental Knowledge of the basic properties of the Sun
- Knowledge about the atmosphere of Stars

Course Outcomes

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Explain the principal environments of the solar system.	K1
CO2	Illustrate the physical theories that control the qualitative properties of different space plasma phenomena.	K2
CO3	Develop an understanding of how space physics has a practical impact on everyday life in the field of space weather.	K3
CO4	Analyze the quantitative behavior of different space physics phenomena using various analysis methods.	K4
CO5	Identify ways in which experimental studies of space physics phenomena have advanced our understanding of basic plasma physics in the field of research.	K5

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	1
CO2	3	3	2	3	1
CO3	3	3	2	1	1
CO4	3	3	3	2	2
CO5	3	3	3	2	1

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no correlation

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Sun and Planetary System: Solar atmosphere - Solar corona - Solar Electromagnetic radiation - Solar cycles and solar variability - Solar Energetic particles - Magnetic field energy - Planetary exploration - Characteristics of the planets - Bulk atmospheric composition - Planetary magnetic fields.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Solar wind interaction with planets: Equations of Magnetohydrodynamics - Formation of Bow shock - Interaction with magnetized planets - Interaction with non-magnetized planets - Motion of charged particles in the electromagnetic field and ring current.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Plasma Waves: Plasma waves in planetary magnetospheres - Plasma environment and outer planets- plasma waves at Venus, Mars, Mercury – Wave-particle interaction - Magnetohydrodynamics (MHD) waves - Plasma instabilities - Applications of Plasma.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Energy deposition by Charged particles: Collision cross section - Time-dependent perturbation theory - The Born Approximation - Semi-empirical electron impact cross-section - Energy deposition techniques - CSDA and Loss function - Analytical yield spectrum - Charge transfer - Electronic Recombination.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Atmosphere of Stars: Introduction – Some Important Definitions – The equation of transfer – The solution of the equation of transfer – Absorption in Stellar Atmospheres – Continuous absorption – Analysis of Spectral line Broadening – The curve of growth – Stellar Temperatures – Chemical composition of Stars.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-study for enrichment: (Not to be included in External Examination) Variable of Stars – A Survey of Variable Stars as a Whole – Structure and Evolution of Stars	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbooks

1. Singhal. R.P., (2015), Elements of Space Physics, PHI Learning Private Limited.
2. Baidyanath Basu., (2013) An Introduction to Astrophysics, PHI Learning Private Limited.

Reference books

1. Margaret G. Kivelson Christopher T. Russell, (1995), Introduction to Space Physics (2nd Edition), Cambridge University Press, USA.
2. Steven Weinberg, (2008), Gravitation and cosmology (1st Edition), Wiley, USA.
3. Raychaudhuri. A.K., Banerji. S., Banerjee. A., (2003), General Relativity (1st Edition), Astrophysics and Cosmology, Springer.

Web Resources

1. <https://www.astrosen.unam.mx/~aceves/verano/libros/SpacePlasma.pdf>
2. https://en.wikipedia.org/wiki/Solar_System
3. https://www.youtube.com/watch?v=Ta_OEZTqB5w
4. <https://www.youtube.com/watch?v=ZsSooLxVae4>
5. <https://science.nasa.gov/astrophysics/>

Pedagogy

Chalk and talk, Assignment, PowerPoint presentation, Group discussion, Seminar

Course Designers:

Dr.M.Kavimani

SEMESTER-IV	INTERNAL MARKS: 40	EXTERNAL MARKS: 60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23PPH4CC4P	ELECTRONICS (P)	CP-IV	6	5

Course Objectives

- To understand the different types electronic devices.
- To study the different applications of operational amplifier circuits.
- To acquire knowledge about combinational logic circuits.
- To learn about sequential logic circuits.
- To understand the concepts involved in logical circuits using IC's.

Pre-requisites

- Basic knowledge on usage of scientific apparatus.
- Hands on experience of simple general and electronics experiments.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Acquire basic knowledge of digital logic levels and its application.	K2
CO2	Analyse and construct combinational logic circuits.	K3,K4
CO3	Demonstrate practical skills in functioning and testing the digital system	K5
CO4	Evaluate the results acquired.	K5
CO5	Take projects in electronics relevant to industrials.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO 1	3	3	2	1	3	2	2	1	1	3
CO 2	2	2	2	1	3	2	2	1	1	2
CO 3	3	3	2	1	3	3	2	1	1	2
CO 4	3	3	3	1	3	3	3	1	1	2
CO 5	3	3	3	1	3	3	3	1	1	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” – indicates there is no correlation.

SYLLABUS

LIST OF EXPERIMENTS (Any 10)

1. Verify the Demorgan's theorems and reduce the Boolean expression.
2. Construction and study of phase Shift Oscillator using IC 741.
3. Study of the Digital to Analog converter (R-2R and Weighted method).
4. Study of Multiplexer and Demultiplexer.
5. Study of Encoder and Decoder.
6. Study of the R-S, clocked R-S and D-Flip flop using NAND gates.
7. Study of the J-K, D and T flip flops using IC 7476/7473.
8. Construction and study of Half Adder and Full Adder using NAND & NOR Gates.
9. Construction and study of Half Subtractor and Full Subtractor using only NAND & NOR Gates.
10. Study of BCD to Seven segment display.
11. Study of the I-V Characteristics and efficiency of solar cell.
12. Construction and study of Schmitt trigger using IC 555.

Text Books

1. Ouseph, C.C., Rao, U.J., & Vijayendran, V., (2009). *Practical Physics and Electronics*. S.Viswanathan, Printers & Publishers Pvt Ltd.
2. Dr.Somasundaram, S., (2012). *Practical Physics*. Apsara Publications.

Reference Books

1. Dunlap, R.A., (1988). *Experimental Physics: Modern Methods*. Oxford University Press, New Delhi.
2. Jones, B.K., (1986). *Electronics for Experimentation and Research*. Prentice-Hall.
3. Zbar, P.B., Malvino, A.P., & Miller, M.A., (1994). *Basic Electronics: A Text-Lab Manual*. Tata Mc-Graw Hill, New Delhi.

Web References

1. <http://vlabs.iitkgp.ernet.in/dec/exp3/index.html>
2. <https://he-coep.vlabs.ac.in/exp/decoders-encodersmultiplexer-demultiplexer/theory.html>
3. <https://de-iitr.vlabs.ac.in/exp/half-full-adder/>
4. <https://de-iitg.vlabs.ac.in/exp/bcd-to-led/simulation.html>

Pedagogy

Demonstration, practical sessions and viva voce

Course Designer

Dr.N.Manopradha

Semester - IV	AazInternal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH4GEC2	TROUBLESHOOTING AND REPAIRING DOMESTIC APPLIANCES	GEC - II	3	2

Course Objectives

- To gain awareness about domestic appliances.
- To learn the fundamentals of different domestic appliances operation and function.
- To develop knowledge of the maintenance of domestic appliances.
- To learn the utilization of different domestic appliances.
- To raise awareness about energy conservation.

Pre-requisites

- Knowledge of the basics of electricity.
- Fundamental ideas of physics in day-to-day life.
- Basic knowledge on the usage of domestic appliances.

Course Outcomes

CO Number	CO Statement On the successful completion of the Course, the students will able to,	Cognitive Level
CO 1	Remember the fundamental principles of electricity, electronics, and the operation of electrical equipment and applications.	K1
CO 2	Interpret the concepts of electronic hardware components and functions.	K2
CO 3	Solve the issue of various domestic appliances.	K3
CO 4	Analyze the problem of energy consumption in appliances.	K4
CO 5	Estimate the energy consumption of domestic appliances based on electricity.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	2	2	3	3	2	1	2
CO2	2	2	2	2	3	3	3	2	2	3
CO3	3	2	1	2	3	3	3	2	2	3
CO4	3	2	2	2	3	3	3	2	1	3
CO5	3	2	1	2	3	3	3	2	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) correlation

“3” – Substantial (High) Correlation

“-” – indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	ELECTRICITY Electric Charge - Voltage - Electric Current - Ohm's Law - Electric Potential - Types of wiring – ISI Rules - Megger testing - Earthing - Serial Circuit - Parallel Circuit - Transformer - Working Principle - Types (Phase , Core, Cooling).	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	ELECTRICAL AND ELECTRONIC COMPONENTS Active and Passive Components: Resistors - Capacitors - Fuses - Relays - Inductors - Semiconducting Devices: Diodes - Types -Transistors - Types - Integrated Circuits - Digital ICs for logic gates - Comparison of electrical and electronic device.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	SOLDERING/ DE- SOLDERING TECHNIQUES Principles of solder connections - Soldering Printed Circuit Boards (PCB) - Types of Solder - Types of PCB - Soldering flux - Soldering Irons - Flux removal after soldering - De - Soldering - Hazards involved in soldering - Safety, health and medical aspects in soldering.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	FUNCTIONALITY OF ELECTRICAL EQUIPMENT Main Components of a Tube Light - Solar powered street lights - Water Heater - Iron box - Purifier - Air Conditioner - Common occurring faults - Possible causes, testing and repairs.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	FUNCTIONALITY OF MOTOR APPLIANCES Working principle and functioning of motor -Types of motor - Mixer - Juicer - Grinder - Electrical fan - Refrigeration System - Vacuum cleaner - Washing machine - UPS - Testing and repairs.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF-STUDY FOR ENRICHMENT (Not included for End Semester Examinations) LED Principle and working - Working of smart Gadgets - Digital display - Safety precautions for using domestic appliances.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Eric Kleinert, (2013), *Troubleshooting and Repairing Major Appliances*, McGraw-Hill Education.3rd Edition
2. Murugesan R, (2017), *Electricity and Magnetism*, S. Chand & Co. Publishing., Revised Edition.
3. Mehta V. K & Rohit Mehta, (2014), *Principles of Eelectronics*, S. Chand & Co.Publishing., Revised Edition.

Reference Books

1. Walter C Bosshart,(1995), *Printed Circuit Board*, McGraw-Hill .RevisedEdition.

Web References

1. [The Basic Principles of Electricity | Anixter](#)
2. [Soldering & Desoldering Techniques | Sciencing](#)
3. [Basic Electronics Tutorials and Revision \(electronics-tutorials.ws\)](#)
4. [Transformer - Definition, Types, Working Principle, Diagram \(byjus.com\)](#)
5. <https://www.constellation.com/energy-101/electrical-safety-tips.html>

Pedagogy

Chalk and Talk , Power Point Presentations, Seminars, Assignments and Quiz.

Course Designer

Dr. B. Anitha

ANNEXURE I

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC
ISO 9001:2015 Certified
TIRUCHIRAPPALLI

PG DEPARTMENT OF CHEMISTRY



B.Sc., Chemistry
Syllabus
2023-2024 and Onwards

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG DEPARTMENT OF CHEMISTRY**

VISION

- To progress into a centre of superiority in Chemistry that will blend state-of-the-art practices in professional teaching in a communally enriching way, with the holistic progress of the students as its prime emphasis.

MISSION

- To produce graduates committed to integrity, professionalism and lifelong learning by widening their knowledge horizons in range and depth.
- To awaken the young minds and discover talents to achieve personal academic potential by creating an environment that promotes frequent interactions, independent thought, innovations, modern technologies and increased opportunities.
- To enhance the quality through basic and applied research frameworks, and encourage the students to take part in entrance and competitive examinations for higher studies and career.
- To enhance services to the community and build partnerships with the industry.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

**PROGRAMME OUTCOMES FOR B.Sc., Mathematics, B.Sc., Physics,
B.Sc., Chemistry PROGRAMME**

PO No.	Programme Outcome On completion of B.Sc., Mathematics, B.Sc., Physics, B.Sc. Chemistry Programme, the students will be able to
PO1	Domain knowledge: Analyze, design and develop solutions by applying firm fundamental concepts of basic sciences and expertise in discipline.
PO2	Problem solving: Ability to think rationally, analyse and solve problems adequately with practical knowledge to assess the environmental issues
PO3	Creative thinking and Team Work: Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO4	Employability: Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO5	Life Long Learning: Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc., CHEMISTRY

PSO NO	Programme Specific Outcomes Students of B.Sc., Chemistry will be able to	POs Addressed
PSO1	Afford a firm foundation in Chemistry that stresses scientific reasoning, analytical problem solving with a molecular perspective	PO1 PO2
PSO2	Acquire knowledge in theoretical and practical tools to exemplify entirely in the working environment.	PO4 PO5
PSO3	Inculcate scientific temperament and create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.	PO3 PO4
PSO4	Scale up of chemical process after designing, optimization and analysis for developing products required for society.	PO4
PSO5	Expand the knowledge available opportunities related to chemistry in the government services through public service commission particularly in the field of food safety, health inspector, pharmacist etc.	PO4 PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
B.Sc. CHEMISTRY

(For the Candidates admitted from the Academic year 2023 - 2024 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / Week	Credits	Exam			Total
							Hrs.	Marks		
								Int.	Ext.	
II	I	Language Course - II (LC)	Pothutamil -II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar – II	22ULH2						
			Prose, Grammar and History of Sanskrit Literature	23ULS2						
			Basic French – II	22ULF2						
	II	English Language Course - II (ELC)	General English– II	23UE2	6	3	3	25	75	100
	III	Core Course - II (CC)	Inorganic and Physical Chemistry	23UCH2CC2	5	5	3	25	75	100
		Core Practical - II (CP)	Inorganic Materials of Industrial Importance (P)	23UCH2CC2P	3	3	3	40	60	100
		Core Course - III (CC)	Material Science	23UCH2CC3	2	2	3	25	75	100
		First Allied Course - III (AC)	ODE, Laplace Transforms and Statistics	22UCH2AC3A	4	3	3	25	75	100
			Biology – II	23UCH2AC3B						
		Ability Enhancement Compulsory Course - II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		IV	Ability Enhancement Compulsory Course - III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-
		Extra Credit Course	SWAYAM		As per UGC Recommendation					
	Total					30	22			

Courses & Credits for UG Science Programmes

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory & Practical)	17	69	99
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	6	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
		44		140

*For BSc Mathematics & BCA

The Internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

For Theory:

- a) The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 75 marks (i.e. 30 marks)

For Practical:

- a) The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e. 24 marks)

Internal Component (Theory)

Component	Marks
Library	05
Assignment & Seminar	10
CIA -I	05
CIA-II	05
Total	25

Internal Component (Practical)

Component	Marks
Observation	05
Record	10
Continual performance	10
Model	15
Total	40

Question Paper Pattern

Answer all the questions

PART A (20X1=20)

Answer all the questions

PART B (5X5=25)

Answer any three questions

PART C (3X10=30)

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
23UCH2CC2	INORGANIC AND PHYSICAL CHEMISTRY	CORE	5	5

Course Objectives

- This course stretches the knowledge about the different techniques involved in metallurgy.
- Discusses about the s and p block elements.
- Provides basic knowledge about solid state and colloidal state of matter.
- Deliberates the basic concepts of gaseous state.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recognize the fundamental ideas of metallurgy, s & p block elements, solid, colloidal and gaseous state.	K1
CO2	Summarize the knowledge on symmetry operations, metals, colloids, molecular velocities and refining process.	K2
CO3	Demonstrate the purification process, structure and applications of compounds.	K3
CO4	Categorize the crystals, periodic elements, colloidal state of compounds	K4
CO5	Interpret the metallurgy techniques, properties of periodic elements and colloids, crystal planes and laws of gaseous state.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	1	3	2
CO2	3	2	1	2	2	3	3	1	1	2
CO3	3	2	2	3	3	3	3	2	2	3
CO4	3	1	2	3	2	3	3	2	1	2
CO5	3	2	3	1	2	3	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Metallurgy Introduction to transition metals-metallurgy-various steps in metallurgy – grinding -pulverizing - concentration (ore dressing)-hand picking - gravity separation - froth floatation - electromagnetic separation - chemical separation - calcinations and roasting – smelting -alumino thermic process- purification of metals - zone refining-vapour phase and electrolytic refining.	15	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5
II	s and p- Block Elements s- Block elements: General characteristics - comparative study of alkali and alkaline earth metals oxides. Diagonal relationship between Li and Mg, Be and Al. p- Block Elements: General characteristic of groups 13-17- boron and its compounds-boric acid- borax - boron nitride - boron trihalide – diborane - compounds of silicon - silicates, silicones and SiCl ₄ .	15	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5
III	Solid State Crystalline and amorphous solids - isotropy and anisotropy - interfacial angle- symmetry in crystal systems - elements of symmetry - space lattice and unit cell - Bravias lattices - seven crystal systems. Law of rational indices - Miller indices - x-ray diffraction – Bragg's law - derivation of Bragg's equation - representation of planes - space lattice - reciprocal lattice. Bragg's equation - experimental technique- powder method and rotating crystal method.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Colloids Colloids – types of colloids –preparation –purification – dialysis – optical properties – kinetic properties – electrical properties of colloids – gold number – stability of sols – associated colloids – cleansing action of soaps and detergents – emulsions – gels – applications of colloids.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	Gaseous State Kinetic theory of gases - derivation of kinetic gas equation - gaseous laws - type of molecular velocities - average velocity - most probable velocity - RMS velocity- Maxwell's distribution of molecular velocities - effect of temperature on distribution of molecular velocities - Maxwell's distribution of molecular energies – collision diameter- collision number - mean free path - viscosity of gases - calculation of collision diameter - mean free path from viscosity measurement.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Minerals and ores - periodic table- states of matter– vanderwaals equation.	-	CO1, CO2, CO3	K1, K2, K3

TextBooks

1. Puri, B.R., Sharma, L. R.& Kalia,K.K. (2018).Principles of Inorganic Chemistry. Shoban Lal Nagin Chand & Co., 33rd edition, New Delhi,.
2. Madan, R.D. (2019). Modern Inorganic Chemistry. 3rd edition, S. Chand & Company Ltd,
3. J. D. Lee, (2014). New Concise Inorganic Chemistry, 5th edition, Oxford Publishers.
4. Puri, B.R., Sharma, L.R. & Pathania, M.S. (2022). Principles of Physical Chemistry. Shoban Lal 48th edition. Nagin Chand & Co, New Delhi.

Reference Books

1. Soni, P.L.& Mohan Katyal. (2017). Text book of Inorganic Chemistry. 25th revised edition, Sultan Chand & Sons.
2. Peter Atkins, Julio de Paula, and James Keeler, (2017). Atkins' Physical Chemistry, 11th Edition, Oxford University Press, UK.

Web Reference

1. <https://classnotes.org.in/class12/chemistry12/general-principles-processes-isolation-elements/purification-refining-metal/>
2. <https://www.askiitians.com/iit-jee-s-and-p-block-elements/>

3. <https://byjus.com/jee/solid-state/>
4. <https://byjus.com/jee/colloids>
5. <https://www.embibe.com/exams/gaseous-state/>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

Dr. A. Sharmila

Semester II	Internal Marks: 40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
23UCH2CC2P	INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE (P)	CORE PRACTICAL	3	3

Course Objective

- Enable the students to develop the preparative skills in inorganic preparations.
- Enable the students to check the purity of organic compounds by determining the melting or boiling points.
- At the end of the course, the students should be able to plan the experimental projects and execute them.

Course Outcome

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the skills required to carry out professional research and production activities in the field of chemistry.	K1
CO2	Define the various terms such as normality, molality, molarity, equivalent weight and molecular weight.	K1
CO3	Select the specific titric method to estimate the amount of analyte present in the given solution.	K1
CO4	Describe the principles and procedures of various titrimetric methods.	K2
CO5	Prepare solutions of desired concentrations.	K3

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	3	3	3	3
CO2	2	2	2	2	2	2	2	3	2	2
CO3	3	2	2	2	2	2	2	2	2	2
CO4	3	2	3	2	2	3	2	2	2	3
CO5	2	3	2	3	3	3	2	2	3	3

“1” – Slight (Low) Correlation –

“2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation –

“-” indicates there is no correlation.

Syllabus

I. Preparation of Solutions

Molarity, Molality, Normality solutions and Buffers.

II. Volumetric Analysis

1. Complexometric titrations
 - a. Estimation of Zinc
 - b. Estimation of Magnesium
 - c. Estimation of Calcium
2. Estimation of Barium Chloride by Mohr's method.
3. Estimation of Chloride ions by Volhard's method.

III. Preparation of Inorganic Compounds.

1. Cuprous Chloride
2. Borax
3. Prussian Blue
4. Potassium trioxalatoferrate (III)
5. Trithioureacopper(II)sulphate dihydrate

Text Books

1. Ramanujam, V.V. (1995) Inorganic Semi-micro Qualitative Analysis. Chennai: National,.
2. Vogel, A. I. (1996). Vogel's Qualitative Inorganic Analysis, Revised by Svehla, G. Logman Scientific.

Reference Books

1. V.Venkateswaran, R.veeraswamy&A.R.Kulandaivelu, (1992). Basic Principles of practical chemistry, 3rd Edn,.
2. Gopalan, R., Venkappayya, D., Nagarajan, S. (2004). Engineering Chemistry: Vikas Publications.

Web References

1. <https://davjalandhar.com/dbt/chemistry/SOP%20LabManuals/B.Sc.%20SEM%20I.pdf>
2. <https://www.youtube.com/watch?v=fv6LJ0KAG1U>
3. https://www.youtube.com/watch?v=S2RZ_KyUI9E

Pedagogy

Hands on training, E-Content, Demo

Course Designer

Dr. A.Sharmila

Semester II	Internal Marks: 25			External Marks: 75	
COURSECODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS	
23UCH2CC3	MATERIAL SCIENCE	CORE	2	2	

Course Objective

- To describe the structure of ceramics and magnetic materials.
- To understand the importance of polymer materials.
- To gain knowledge about composites.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall conductors, magnetic, polymer, LCD and composite materials.	K1, K2
CO2	Describe the classification of different materials.	K2
CO3	Illustrate the role of energy in various materials.	K3
CO4	Analyze the materials using theoretical concepts.	K4
CO5	Evaluate semiconductors, hysteresis curve, perovskite structure, reinforced composites.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	2	3	3
CO5	3	3	2	2	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Conductors and Insulators Introduction - semiconductors - classification of semiconductors - intrinsic and extrinsic - n-type and p-type - crystal structure and bonding in Si and Ge - elemental and compound semiconductors - applications - Insulators.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Magnetic Materials Magnetic dipole - dipole moment - magnetic field strength - magnetic susceptibility - diamagnetic - paramagnetic - ferromagnetic - curie temperature - hysteresis curve - antiferromagnetic - ferrimagnetic - hard and soft magnetic materials - properties - examples - applications.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Ceramics and Display Devices Classification of ceramics - structure of the ceramics- compounds with Fluorite - Perovskite structure - properties of ceramics- applications - active display devices- Light Emitting Diode (LED) - passive display devices - Liquid Crystal Display (LCD)- applications.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Polymer Materials Introduction - polymerization mechanism - degree of polymerization - classification of polymers - structure of polymer - fabrication process - properties – applications.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Composite Materials Introduction - constitution - classification - particle reinforced – fibre reinforced - fiber glass reinforced - other fiber reinforced - metal matrix fiber - hybrid	06	CO1, CO2, CO3, CO4,	K1, K2, K3, K4,

	composites processing of fiber reinforced -composites - applications of composite materials.		CO5	K5
VI	Self Study for Enrichment (Not to be included for External Examination) Composite interfaces - bonding mechanisms - other interfacial properties - polymer matrix composites - ceramic matrix composites - composite strengths - fibers as reinforcements.	-	CO1	K1, K2

Text Books

1. Rajendran, V. & Marikani, A. (2009). Materials Science. (9th ed.). Tata McGraw-Hill Publishing Company Limited.
2. Van Vlack, L. H., (1975). Elements of materials science and engineering. (6th ed.). Addison-Wesley.
3. Jain, P.C., & Jain, M., (2013). Engineering Chemistry. (6th ed.). Dhanpat Rai & Sons.

Reference Books

1. Callister, W.D., & Rethwisch, G.D., (2018). Materials Science and Engineering: An Introduction. (10th ed.). Wiley.
2. Kingery, W.D., Bowen, & H.K., Uhlmann, D.R., (1976). Introduction to Ceramics. (2nd ed.). Wiley.
3. Sharma, B.K., (1997). Industrial Chemistry. (8th ed.). Goel Publishing.

Web References

1. <https://www.uniweimar.de/kunstundgestaltung/wiki/images/Conductors,insulators,semiconductors.pdf>
2. <https://slideplayer.com/slide/13949334/>
3. <https://www.youtube.com/watch?v=WHYfDVxi-Qw>
4. <https://irimee.indianrailways.gov.in/instit/uploads/files/1435551295008-POLYMER-%20L-1.pdf>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

Dr. P. Thamizhini

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC
ISO 9001:2015 Certified
TIRUCHIRAPPALLI

PG AND RESEARCH DEPARTMENT OF CHEMISTRY



B.Sc., Chemistry
Syllabus
2022-2023 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG DEPARTMENT OF CHEMISTRY

VISION

- To progress into a centre of superiority in Chemistry that will blend state-of-the-art practices in professional teaching in a communally enriching way, with the holistic progress of the students as its prime emphasis.

MISSION

- To produce graduates committed to integrity, professionalism and lifelong learning by widening their knowledge horizons in range and depth.
- To awaken the young minds and discover talents to achieve personal academic potential by creating an environment that promotes frequent interactions, independent thought, innovations, modern technologies and increased opportunities.
- To enhance the quality through basic and applied research frameworks, and encourage the students to take part in entrance and competitive examinations for higher studies and career.
- To enhance services to the community and build partnerships with the industry.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

**PROGRAMME OUTCOMES FOR B.Sc., Mathematics, B.Sc., Physics,
B.Sc., Chemistry PROGRAMME**

PO No.	Programme Outcome On completion of B.Sc., Mathematics, B.Sc., Physics, B.Sc. Chemistry Programme, the students will be able to
PO1	Domain knowledge: Analyze, design and develop solutions by applying firm fundamental concepts of basic sciences and expertise in discipline.
PO2	Problem solving: Ability to think rationally, analyse and solve problems adequately with practical knowledge to assess the environmental issues
PO3	Creative thinking and Team Work: Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO4	Employability: Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO5	Life Long Learning: Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc., CHEMISTRY

PSO NO	Programme Specific Outcomes Students of B.Sc., Chemistry will be able to	POs Addressed
PSO1	Afford a firm foundation in Chemistry that stresses scientific reasoning, analytical problem solving with a molecular perspective	PO1 PO2
PSO2	Acquire knowledge in theoretical and practical tools to exemplify entirely in the working environment.	PO4 PO5
PSO3	Inculcate scientific temperament and create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.	PO3 PO4
PSO4	Scale up of chemical process after designing, optimization and analysis for developing products required for society.	PO4
PSO5	Expand the knowledge available opportunities related to chemistry in the government services through public service commission particularly in the field of food safety, health inspector, pharmacist etc.	PO4 PO5

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
B.Sc. CHEMISTRY

(For the Candidates admitted from the Academic year 2022 - 2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / Week	Credits	Exam			Total
							Hrs.	Marks		
								Int.	Ext.	
IV	I	Language Course - IV (LC)	Pandaiya Illakiyamum Urainadaiyum	22ULT4	6	3	3	25	75	100
			Hindi Literature and Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French – II	22ULF4						
	II	English Language Course - IV (ELC)	Learning Grammar through Literature – II	22UE4	6	3	3	25	75	100
	III	Core Course - V(CC)	Inorganic and Organic Chemistry	22UCH4CC5	6	6	3	25	75	100
		Core Practical - IV(CP)	Inorganic Qualitative Analysis (P)	22UCH4CC4P	4	4	3	40	60	100
		Second Allied Course - III (AC)	Physics – II	22UCH4AC6	4	3	3	25	75	100
		Internship	Internship	22UCH4INT	-	2	-	-	-	100
	IV	Generic Elective Course - II (GEC)	Food Adulterants and Health Care	22UCH4GEC2	2	2	3	25	75	100
			Basic Tamil-II	22ULC4BT2						
			Special Tamil-II	22ULC4ST2						
		Skill Enhancement Course - I (SEC)	Chemistry of Consumer Products (P)	22UCH4SEC1P	2	2	3	40	60	100
	Extra Credit Course	SWAYAM		As per UGC Recommendation						
	Total				30	25				800
V	III	Core Course - VI(CC)	Inorganic Chemistry – I	22UCH5CC6	6	6	3	25	75	100
		Core Practical - V(CP)	Physical Chemistry (P)	22UCH5CC5P	3	3	3	40	60	100
		Core Course - VII(CC)	Organic Chemistry – I	22UCH5CC7	6	6	3	25	75	100
		Core Course - VIII(CC)	Physical Chemistry – I	22UCH5CC8	6	6	3	25	75	100
		Discipline Specific Elective - I	A. Nuclear and Industrial Chemistry	22UCH5DSE1A	5	4	3	25	75	100
			B. Basics of Nanoscience	22UCH5DSE1B						

		(DSE)	and Nanotechnology							
			C.Polymer Chemistry	22UCH5DSE1C						
	IV	Ability Enhancement Compulsory Course - IV(AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course - II (SEC)	Water Analysis (P)	22UCH5SEC2P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM		As per UGC Recommendation					
Total					30	29				700

Courses & Credits for UG Science Programmes

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory & Practical)	17	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
		44		150

*For BSc Mathematics & BCA

The Internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

For Theory:

- The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 75 marks (i.e. 30 marks)

For Practical:

- The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e. 24 marks)

Internal Component (Theory)

Component	Marks
Library	05
Assignment & Seminar	10
CIA -I	05
CIA-II	05
Total	25

Internal Component (Practical)

Component	Marks
Observation	05
Record	10
Continual performance	10
Model	15
Total	40

Question Paper Pattern

Answer all the questions

PART A (20X1=20)

Answer all the questions

PART B (5X5=25)

Answer any three questions

PART C (3X10=30)

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCH4CC5	INORGANIC AND ORGANIC CHEMISTRY	CORE	6	6

Course Objectives

1. To learn the general characteristics of d and f block elements.
2. To understand the reactions of organometallic compounds.
3. To study about the preparation and properties of alcohols, phenols and ethers.
4. To understand the arrangement of atoms in space, isomers and the nomenclature.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Outline the synthesis of organometallics and oxygen containing functional groups and symmetry elements.	K1, K2
CO2	Describe the general characteristics of d and f block elements, organic compounds and stereoisomers.	K3
CO3	Analyze the trends of the periodic properties, reactions and types of stereoisomers.	K4
CO4	Distinguish between 3d, 4d and 5d elements, functional isomers and	K5
CO5	Predict the properties of transition, inner transition elements and configuration of organic compounds	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	1	3	2
CO2	3	2	1	2	2	3	3	1	1	2
CO3	3	2	2	3	3	3	3	2	2	3
CO4	3	1	2	3	2	3	3	2	1	2
CO5	3	2	3	3	3	3	3	2	2	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	CONGNITIVE LEVEL
I	Chemistry of d-Block Elements: Position of d-block element-electronic configuration-classification-general characteristics -atomic radii-ionic radii-metallic character-melting point and boiling point-atomic volume - densities-ionization energies-standard oxidation potential - reducing properties-variable oxidation state-catalytic properties-color of transition metal complexes-Magnetic properties-formation of complex compounds-formation of interstitial compounds-alloy formation. comparison between elements of 3d series with 4d and 5d series.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Chemistry of f-Block Elements: General characteristics of f block elements-comparative account of lanthanides and actinides-occurrence-oxidation state-magnetic properties-color and spectra-lanthanides - actinides-separation by ion exchange - solvent exchange methods-lanthanide and actinide contraction - chemistry of thorium - uranium-occurrence-ores- extraction and uses-compounds of uranium and thorium-preparation-properties-uses.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Chemistry of Organometallic compounds: Introduction-classification-preparation properties and uses of organo magnesium compounds, organozinc compounds, organolithium, organocopper, organolead,	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	organophosphorus and organoboron compounds			
IV	Chemistry of Alcohols, phenols and Ethers: Nomenclature- preparation of alcohols-industrial source of alcohols-physical properties -chemical properties-uses-chemistry of glycols and glycerols-uses-preparation of phenols including di and tri hydric phenols - physical and chemical properties-uses-aromatic electrophilic substitution mechanism-theory of orientation and reactivity- preparation of ether - epoxides - physical properties-chemical properties-uses.	18	CO1, CO2, CO3, CO4, CO5	
V	Stereochemistry: Stereoisomers - types-concept of chirality- elements of symmetry - enantiomers - diastereomers –fisher projection representation -R, S configuration-sequence rule-D and L-nomenclature- erythro and threo nomenclature. Compounds with two stereogenic centre-optical isomers of lactic acid, tartaric acid. geometrical isomers – <i>cis-trans</i> system- <i>E-Z</i> system. Racemic mixture-resolution of racemic mixture – Walden Inversion – conformational analysis of methane, ethane and n-butane and cyclohexane.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-Study for Enrichment: (Not to be included for External Examination) Periodic table- classification of elements-periodic properties - types of organic reaction - Basics of symmetry and isomers.		CO1, CO2, CO3	K1, K2, K3, K4

Text books

1. Puri B. R, Sharma L. R, Kalia K. K. Principles of Inorganic Chemistry, 23rd edition, New Delhi, Shoban Lal Nagin Chand & Co., (1993).
2. Madan R. D. Modern Inorganic Chemistry, 2nd edition, S. Chand & Company Ltd., 2000.
3. Bhupinder M. Manju M., Organic chemistry, (2 nd edition), Delhi, PHI Learning Private Limited.
4. Bahl, B.S. and Bahl, A., Advanced Organic Chemistry, (12th edition), New Delhi, Sultan Chand & Co., (2010).
5. Soni P.L. Chawla H.M., Text book of Organic chemistry, Sultan Chand & Sons.

Reference books

1. Malik W.U, Tuli G.D, Madan R.D, selected topics in Inorganic chemistry, S Chand and Company limited, New Delhi.
2. Lee J. D. Concise Inorganic Chemistry, 20th revised edition, Sultan Chand & Sons, 2000.
3. Finar I.L., Organic Chemistry, Vol 1&2, (6th edition) England, Addison Wesley Longman Ltd. (1996).
4. Morrison R.T. and Boyd R.N., Bhattacharjee S. K. Organic Chemistry (7th edition), Pearson India, (2011)

Web References:

1. <https://unacademy.com/content/cbse-class-12/study-material/chemistry/d-block-elements/>
2. <https://study.com/learn/lesson/d-block-elements-properties-electron-configuration.html>
3. <https://www.aakash.ac.in/important-concepts/chemistry/actinides>
4. https://www.usb.ac.ir/FileStaff/2896_2019-4-18-0-9-32.pdf
5. <https://colapret.cm.utexas.edu/courses/Chapter%2015.pdf>
6. <https://www.askiitians.com/revision-notes/chemistry/alcohols-phenols-and-ether/>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

Dr. C. Rajarajeswari

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCH4CC4P	INORGANIC QUALITATIVE ANALYSIS (P)	CORE	4	4

Objectives

- To learn the techniques of semi micro qualitative analysis.
- To know the nature of acidic and basic radicals.
- To learn the separation of groups.

Course outcomes

On the successful completion of the course, students will be able to

CO	CO Statements	Knowledge Level
CO1	Recall the nature of acidic and basic radicals	K1
CO2	Identify the cations and anions present in the mixture	K2
CO3	Analyze the principles of inorganic qualitative analysis.	K3
CO4	Demonstrate the experimental methods of group separation	K4
CO5	Plan, execute and record all the experimental results.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	2	2	2	3	1	2	2	2	1	1
CO5		3	3	1	3	2	3	3	3	1

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

SYLLABUS INORGANIC QUALITATIVE ANALYSIS (P)

Analysis of a mixture containing two cations and two anions of which one will be an interfering acid radical.

Semi micro methods using the conventional method with sodium sulphide may be adopted.

Cations to be studied:

Lead, copper, bismuth, iron, aluminium, zinc, manganese, cobalt, nickel, barium, calcium, strontium, magnesium and ammonium.

Anions to be studied:

Carbonate, Sulphate, Nitrate, Chloride, Fluoride, Borate, Oxalate and Phosphate.

Text Books

1. Venkateswaran V. Veerasamy R. Kulandaivelu A.R., Basic principles of Practical Chemistry, 2nd edition, New Delhi, Sultan Chand & sons (1997)

Reference book

1. Svehla G. Sivasankar B. Vogels Qualitative Inorganic Analysis, 7th Edition, Pearson Education

Web References

1. <http://rbmcollege.ac.in/sites/default/files/files/reading%20material/inorganic-qualitative-analysis.pdf>
2. https://chem.libretexts.org/Bookshelves/Analytical_Chemistry/Supplemental_Modules
3. <https://byjus.com/chemistry/salt-analysis/>
4. <https://chemlab.truman.edu/files/2015/07/Inorganic-Qualitative-Analysis.pdf>
5. <https://www.teachmint.com/tfile/studymaterial/b-sc/inorganicchemistry/qualitativeanalysis/a9301386-a267-44c7-886a-09c64f439dcb>

Pedagogy

Demonstration and practical sessions

Course Designers

❖ **Dr. C. RAJARAJESWARI**

Semester IV	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	CREDITS
22UCH4SEC1P	CHEMISTRY OF CONSUMER PRODUCTS (P)	SKILL ENHANCEMENT COURSE	2	2

Course Objectives

- To know the basic knowledge in chemistry of consumer products and modern trends in the industry.
- To provide the practical training to the students in consumer product analysis

Course outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statements	Knowledge Level
CO 1	On the successful completion of the course, students will be able to Outline the various adulterants in food products.	K1
CO 2	Explain the procedures for detecting the adulterants.	K2
CO 3	Identify the nature of adulterants added to consumer products.	K2
CO 4	Differentiate the pure and impure food samples.	K2
CO 5	Calculate the percentage composition of food colorant in food and beverages.	K3

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	3	3	2	2	2	2	2	2	2	2
CO5	3	2	1	1	2	3	2	2	1	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” Indicates there is No Correlation

Syllabus

01. Detection of adulterants in milk and milk products.
02. Detection of adulterants in oil
- 03, Detection of adulterants in spices and condiments.
04. Detection of adulterants in food products.
05. Estimation of food colors. (Colorimetric analysis)

Text Books

1. Sally A. Henrie, (2015), Green Chemistry Laboratory Manual for Green Chemistry, Press Taylor & Francis Group and Informa Business.

Reference book

1. Gajanan Shrike, (2022), Food & Beverage Adulteration and its Implications theory and Practice, Notion Press.

Web References

1. <https://dfda.goa.gov.in/images/PDF-DOCUMENTS/quciktestforsomeadullterantsinfood-fssaiinitiative.pdf>
2. <https://www.hansshodhsudha.com/first-second-issues/New%20Hansraj%20College%20Book-1-20-26.pdf>
3. <https://www.fssai.gov.in/book-details.php?bkid=201>

Pedagogy

Demonstration and Practical Sessions

Course Designer

- Dr. A.Sharmila

Semester V	InternalMarks:25	ExternalMarks:75		
COURSECODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UCH5CC6	INORGANIC CHEMISTRY -I	Core Course	6	6

Course Objective:

- To understand the concept of metallurgy
- To impart basics and theories of coordination compounds.
- To study biologically important coordination compounds.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the process of metallurgy and reactions of complexes.	K1, K2
CO2	Recognize the Ellingham diagram and basic concepts of co-ordination chemistry.	K3
CO3	Examine the purification process, Werner theory, 10Dq and MO diagram of octahedral complexes.	K3
CO4	Analyze calcination, roasting, Sidgewick theory, stability and magnetic property of metal complexes.	K4
CO5	Criticize metallurgical process, VB, CFSE, MO theories and reactions of coordination compounds.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	3	2	2	3	2	2	3	3	3	2
CO3	3	3	3	2	2	3	2	2	2	3
CO4	3	3	3	2	3	3	2	2	2	3
CO5	3	3	2	3	3	3	3	2	3	3

“1”–Slight (Low)Correlation
 “3”–Substantial (High)Correlation

“2”–Moderate(Medium)Correlation
 “-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	CONGNITIVE LEVEL
I	UNIT-I Metallurgy Minerals and ores - process - ore dressing - gravity separation - froth flotation magnetic separation - chemical separation- calcination and roasting. Extraction of metal-chemical reduction-auto reduction-electrolytic reduction-metal displacement. Refining methods - Van Arkel method - electrolytic refining - vapour phase refining-ion exchange method- Thermodynamic principles of metallurgy-Ellingham diagram - observations - applications.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	UNIT-II Coordination Compounds –I Introduction – classification of ligands – uses of chelates -nomenclature of coordination compounds- isomerism- structural isomerism – stereo isomerism - bonding theories - Werner’s theory -Sidgwick's concept of coordination - Valence bond theory – postulates - geometries of tetrahedral - square planar and octahedral complexes - limitations.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	UNIT-III: Coordination Compounds –II Crystal field theory - shapes of d orbitals- assumptions- splitting of d-orbitals in octahedral-tetrahedral and square-planar complexes - crystal field stabilization energy- factors affecting magnitude of $10Dq$ – color of the transition metal complexes – number of unpaired electron - magnetic properties of octahedral complexes– spectro chemical series – Jahn -Teller theorem.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	UNIT -IV: Stability of Metal Complex Labile and inert complexes - thermodynamic stability and kinetic stability-stepwise and overall	15	CO1 CO2 CO3 CO4	K1 K2 K3 K4

	formation constant- Relation between β_n and K_n - factors affecting stability of metal complexes- chelate effect – Experimental determination of stability constant and composition of complex.		CO5	
V	UNIT-V: Ligand substitution reactions Types of substitution reaction – Nucleophilic – Electrophilic substitution reactions – hydrolysis reaction – Acid hydrolysis - base hydrolysis of octahedral complexes – Anation reaction- Substitution reaction in square planar complexes - trans effect – Theories of trans effect - applications. Mechanism of substitution reaction in Pt(II) complexes- Factors affecting rate of substitution.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	Self-study: (Not included for End Semester Examination) Diagonal, trigonal and tetragonal distortion, instability constant – John Teller Distortion stabilization Energy		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Books:

1. Malik, W. U., Tuli, G. D., & Madan, R. D. (1998). *Selected topics in inorganic chemistry*. S. Chand Publishing.
2. Housecroft, C. E., & Sharpe, A. G. (2008). *Inorganic chemistry* (Vol. 1). Pearson Education.
3. Cotton, F. A., Wilkinson, G., Murillo, C. A., & Bochmann, M. (1999). *Advanced inorganic chemistry*. John Wiley & Sons.
4. Madan, R. D. (2019). *Satya Prakash's Modern Inorganic Chemistry*. S. Chand Publishing.
5. Prakash, S., Tuli, G. O., Basu, S. K., & Madan, R. D. (2000). *Advanced Inorganic Chemistry, Vol 2, S. Chand Group, New Delhi, India*.

Reference Books:

1. Chhatwal, G. R., & Mehra, H. (1974). *Advanced inorganic chemistry*.
2. Sharma, R. K. (2007). *Text Book of Coordination Chemistry*. Discovery publishing house.
3. Gopalan, R. (2001). *Concise coordination chemistry*. Vikas publishing house.

4. Srivastva, A. N. (Ed.). (2020). *Stability and Applications of Coordination Compounds*. BoD–Books on Demand.
5. Raj, G. (2010). *Advanced Inorganic Chemistry: Vollume II*. Krishna Prakashan Media.

Web Reference:

1. <https://download.e-bookshelf.de/download/0000/5777/25/L-G-0000577725-0002359455.pdf>
2. https://www2.chemistry.msu.edu/courses/cem151/chap24lect_2019.pdf
3. <https://www.scribd.com/document/464488620/INTRODUCTION-TO-COORDINATION-CHEMISTRY>
4. <https://egyankosh.ac.in/bitstream/123456789/71758/3/Unit-4.pdf>
5. <https://teachmint.storage.googleapis.com/public/555766642/StudyMaterial/4730da7d-1f2a-4a70-a473-0cc7cd84dc13.pdf>

Pedagogy

Chalk and talk, PPT, You tube, E-content, Group Discussion, Assignment, Quiz and Seminar

Course Designers

Dr.P. Pungayee Alias Amirtham

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UCH5CC5P	PHYSICAL CHEMISTRY (P)	CORE PRACTICAL - V	3	3

Course Objectives

- To learn the methods of finding CST, TT, Molecular weight and rate constant.
- To understand the fundamentals of conductometric and potentiometric titrations.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Recall the basic principles related to physical chemistry experiments.	K1 & K2
CO2	Scientifically plan and perform kinetics, rast and adsorption experiments.	K3 & K4
CO3	Relate the effect of impurity on phenol water system and identify the molecular weight of unknown compound.	K4 & K5
CO4	Calculate and process the experimentally measured values and compare with graphical data.	K5
CO5	Examine the concentration of ions using potentiometer, conductometer and interpret the data scientifically	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	1	3	2
CO2	3	2	1	2	2	3	3	1	1	2
CO3	3	2	2	3	3	3	3	2	2	3
CO4	3	1	2	3	2	3	3	2	1	2
CO5	3	1	2	3	2	3	3	2	1	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation.

SYLLABUS

1. Determination of rate constant for acid catalyzed ester hydrolysis.
2. Critical Solution Temperature - Phenol-Water system.
3. Effect of impurity (NaCl) on Critical Solution Temperature.
4. Rast Method – Determination of molecular weight of unknown solute.
5. Transition temperature of a salt hydrate – determination of molecular weight.
6. Phase Diagram of simple eutectic system.
7. Adsorption of acetic acid on activated charcoal, verification of Freundlich isotherm.
8. Kinetics of Persulphate-Iodide Reaction.
9. Preparation of buffer solutions at different pH
 - i) Sodium acetate-acetic acid
 - ii) Ammonium chloride-ammonium hydroxide
10. Conductometric Acid-Base Titration - (HCl vs NaOH).
11. Potentiometric Redox Titration – (FAS vs KMnO₄).
12. Determination of equivalent conductance of a strong electrolyte (NaCl/KCl).

Text Books

1. Viswanathan B and Raghavan P.S, Practical Physical Chemistry (2009), Viva Books, New Delhi.
2. Sundaram, Krishnan (1996), Raghavan, Practical Chemistry (Part II), Viswanathan Co. Pvt.
3. Athawale and Parul Mathur (2008), Experimental Physical Chemistry, New Age International (P)Ltd., New Delhi.
4. Lewers E.G (2011), Computational Chemistry: Introduction to the Theory and Applications of Molecular and Quantum Mechanics, 2nd Ed., Springer, New York.

Reference Books

1. Yadav J.B, (2001), Advanced Practical Physical Chemistry, Goel Publishing House,
2. Gurthu J.N and Kapoor R (1987), Advanced Experimental Chemistry, S. Chand & Co.,

Web References

1. <https://www.slideshare.net/mohdsakharkar/acid-base-catalysed-ester-hydrolysis>.
2. <https://www.slideshare.net/sandeepkumaryadav4/critical-solution-temperature-of-phenolwater-system>.
3. <https://davjalandhar.com/dbt/chemistry/SOP%20LabManuals/B.Sc.%20SEM%20V.pdf>.
4. <https://ncert.nic.in/pdf/publication/sciencelaboratorymanuals/classXII/chemistry/lelm106.pdf>.
5. <https://www.slideshare.net/adujoy/triiodide>.

Pedagogy

Chalk and talk, E-content, Demo, Hands on training, Quiz, Assignments.

Course Designer

➤ Dr. K. Uma Sivakami

Semester V	Internal Marks: 25		External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS	
22UCH5CC7	ORGANIC CHEMISTRY-I	CORE	5	5	

Course Objectives

- This course helps to learn the reactions of carboxylic acids, amines, carbonyl compounds and Heterocyclic compounds.
- To recognize the mechanism of rearrangements.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge level
CO1	On successful completion of the course, the student will be able to Recognize the nature of organic compounds and rearrangements	K1
CO2	Discuss about synthesis of organic compounds.	K2
CO3	Demonstrate various reactions of different functional group with mechanism.	K3
CO4	Distinguish the reactivity of organic substances and rearrangements.	K4
CO5	Predict the appropriate method for separation of amines and pathways of rearrangements.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PO4	PO5	PO1	PO2	PO3	PO4	PO5
CO 1	3	3	2	2	2	3	2	1	3	2
CO2	3	2	1	2	2	3	3	1	1	2
CO3	3	2	2	3	3	3	3	2	2	3
CO4	3	1	2	3	2	3	3	2	1	2
CO5	3	2	3	1	2	3	3	2	3	3

1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Carboxylic Acid and Their Derivatives Aliphatic acids: Saturated monocarboxylic acid – resonance structure – relative strength of carboxylic acids (effect of substituents) - Reactive methylene compounds: Preparation- properties - uses of ethyl acetoacetate - diethyl malonate. Aromatic acids: Monocarboxylic acids – general methods of preparation - properties - reactions of benzoic acid - salicylic acid. Dicarboxylic acid: Preparation - properties - uses of phthalic acid - terephthalic acid.	15	CO1 CO2 CO3 CO4	K1, K2, K3, K4
II	Chemistry of Nitrogen Compounds Amines: aliphatic and aromatic amines - classification – general methods of preparation- properties and reactions - separation of mixture of amines - Basicity of amines - effect of substituents - distinction between primary, secondary and tertiary amine - Aliphatic diazo compounds: Preparation - properties of diazomethane-Diazonium compounds: Benzene diazonium chloride – structure - reactions - synthetic applications of diazo coupling reaction.	15	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
III	Carbonyl Compounds - Aldehydes and Ketones Structure - acidity of α -hydrogen – methods of preparation- physical properties - chemical properties – reactivity of carbonyl group- nucleophilic addition - addition of HCN - addition of derivatives of ammonia - addition of sodium bisulphate - addition of Grignard reagent - Reformatsky - Wittig reaction - oxidation and reduction reactions - Aldol condensation - Benzoin condensation - Cannizzaro reaction – Iodoform reaction.	15	CO1 CO2 CO3 CO4	K1, K2, K3, K4
IV	Heterocyclic Compounds and Dyes Heterocyclic Compounds: Nomenclature – Chemistry of	15	CO1 CO2	K1, K2, K3, K4

	furan- thiophene - pyrrole – pyridine- Fused ring heterocyclic compounds: Quinolone - isoquinoline - indole. Dyes: Introduction – colour - constitution - classification based on structure - application. Preparation and applications of the following dyes – methyl orange- Congo red- malachite green and indigo.		CO3 CO4	
V	Molecular Rearrangements: Types of rearrangement (nucleophilic and electrophilic) – mechanism with evidence for the following re-arrangements - Pinacol – Pinacolone. Benzil - Benzilic acid, Benzidine, Claisen, Fries, Hofmann, Curtius, Lossen, Beckmann and Dienone – phenol rearrangements.	15	CO1 CO2 CO4 CO5	K1, K2, K4, K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Preparation of aliphatic carboxylic acids- nitro alkanes and alkyl nitrites - addition of oxygen nucleophiles - reactions of pyridine-N-Oxide.	--	CO1 CO2 CO3	K1, K2, K3

Text Books

1. Bahl, B.S and Bahl .A. (2010), Advanced Organic Chemistry 12th edition, Sultan Chand &Co., New Delhi.
2. Soni. P.L, (2006), Text Book of Inorganic Chemistry, S. Chand & Co., New Delhi.
3. Bhupinder Mehta and Manju Mehta, (2015), Organic Chemistry, Prentice Hall of India Pvt Ltd., New Delhi.

Reference Books

1. Finar I.L. (1996), Organic Chemistry Volume 1&2 (6th edition), Addison Wesley Longman Ltd., England.
2. Morrison R.T. and Boyd R.N. and Bhattacharya S.K. (2011) Organic Chemistry (7th edition) Pearson India.
3. Tewari K.S., Vishil N.K. and Mehotra. S.N (2001), A text book of Organic Chemistry (1st edition), Vikas Publishing House Pvt Ltd., New Delhi.
4. Pine.S.H, (1987), Organic Chemistry (5th edition), McGraw-Hill International Book Company,

New Delhi.

5. Seyhan N. Ege ., (2005)Organic Chemistry (5th edition),Houghton Mifflin Co., New Delhi

Web Reference

1. <https://byjus.com/chemistry/carboxylic-acid-properties/>
2. https://www.ch.ic.ac.uk/widdowson/teach_files/nitrogen/dw1.html
3. <https://www2.chemistry.msu.edu/faculty/reusch/virttxtjml/aldket1.htm>
4. https://www.chem.gla.ac.uk/staff/stephenc/teaching/HeterocycleLectures2011_2C12.pdf

Pedagogy

E-content, Lecture, Power Point Presentation, Seminar, Assignment, Quiz, Group discussion, Video/Animation.

Course Designers

1. Dr. A. Sharmila

Semester V	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCH5CC8	PHYSICAL CHEMISTRY – I	CORE COURSE-VIII	6	6

Course Objective

- To understand laws of thermodynamics, photochemical process and types of electronic transitions,
- To learn the behaviors of dilute solutions and colligative properties, colloids, adsorption phenomena, phase rule and its significances.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Find equilibrium constant and enthalpy of equilibrium reaction at different temperature	K1
CO2	Discuss thermodynamic conditions favoring chemical equilibrium.	K2
CO3	Evaluate physical and chemical adsorption phenomenon	K3
CO4	Explain phase rule and law of dilute solution to predict composition, molecular weight	K3
CO5	Analyse quantum yield and Identify types of electronic transition in organic molecules	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	2	3	2	1	2	3	2	2	2	3
CO4	3	3	2	2	3	2	2	1	2	3
CO5	3	3	2	3	3	3	3	2	1	3

“1” – Slight (Low) Correlation –

“3” – Substantial (High) Correlation –

“2” – Moderate (Medium) Correlation –

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Chemical Equilibrium, Zeroth and Third Law Thermodynamics Law of mass action - thermodynamic treatment - Van't Hoff reaction isotherm- temperature dependence of the equilibrium constant - Van't Hoff equation- integrated form of Van'tHoff equation – homogeneous-heterogeneous systems (NH ₃ , PCl ₅ and CaCO ₃) - relationship between K _p and K _c -Factors affecting chemical equilibrium - Le - Chatlier principle (Haber's and Contact processes) - Zeroth law of thermodynamics - absolute temperature scale - statement of third law - Nernst heat theorem.	18	CO1, CO2, CO3, CO4	K1, K2, K3,K4, K5
II	Molecular Thermodynamics Thermodynamics of systems of variable composition – partial molar properties – chemical potential – relationship between partial molar quantities – Gibbs Duhem equation -applications- thermodynamic properties of real gases – fugacity concept – calculation of fugacity of real gas – activity - activity coefficient – concept – definition – standard states - experimental determinations of activityand activity coefficient of electrolytes.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4 ,K5
III	Surface Chemistry Definition of colloids - solids in liquids (Sols) – preparation – purification - properties – kinetic-optical - electrical - stability of colloids - Hardy	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,

	Schule law - protective colloids - liquids in liquids (emulsions) – preparation - properties - uses - liquids in solids (gels) – preparation- properties - adsorption - physical adsorption - chemisorption- Freundlich - Langmuir adsorption isotherms - applications of adsorption.			K4, K5,
IV	Phase Rule Concept of phase- component - degrees of freedom - Gibb's phase rule - phase equilibrium - one component system – water system - sulphur system – two component system – solid liquid equilibrium. Simple eutectic diagram of Pb-Ag system- simple eutectic diagram- desilverisation of lead compound formation with congruent melting point – (Mg-Zn) - incongruent melting point (Na-K) – NaCl –water system-freezing mixtures.	18	CO1, CO2, CO3, CO4,CO5	K1, K2, K3, K4, K5
V	. Electronic Spectroscopy and Photochemistry Molecular spectra - Energy levels of molecular orbitals - electronic spectroscopy - selection rules - types of electronic transitions- concept of chromophore - auxochrome. Photochemistry: Difference between thermal and photochemical processes- laws of photochemistry - Grothus-Draper's law - Stark-Einstein's law of photochemical equivalence - quantum yield- photochemical reaction mechanism- hydrogen-chlorine, hydrogen- bromine reaction - energy transfer processes - Jablonski diagram- qualitative description of fluorescence - phosphorescence – photosensitized reactions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self-Study for Enrichment: (Not to be included for External Examination.) First and second laws of thermodynamics, reduced phase rule equation, Critical solution temperature, BET adsorption isotherm.	-	CO1, CO2 CO3	K1, K2, K3, K4

Text Book

1. Puri B. R. ,Sharma, L. R. and Pathania, M. S. (2013). Principles of Physical Chemistry, Shoban Lal Nagin Chand & Co., New Delhi
2. S. Glasstone and D. Lewis, (2014). Elements of Physical Chemistry, Mac Millon Ltd, London
3. Banwell C.N, (1994). Fundamentals of Molecular Spectroscopy, Mc GrawHill Education , Noida

Reference books

1. Puri B.R., Sharma L.R., and Kalia K.K (1993), Principles of Physical Chemistry 23rd edition, Shoban Lal Nagin Chand &Co.New Delhi.
2. Maron and Prutton, (1969). Physical Chemistry, Mac Millan, London
3. Atkins P.W., (1994). Physical Chemistry, 5th edition, Oxford University Press.
4. Gabor a Sobarjai and Yimin Li, (2010). Introduction to Surface Chemistry and Catalysis, 2nd edition, John Wiley & Sons, New Jersey

Web References

- <https://ocw.mit.edu/courses/5-61-physical-chemistry-fall-2017/resources/electronic-spectroscopy-and-photochemistry/>
- <https://www.chadsprep.com/chads-general-chemistry-videos/3-laws-of-thermodynamics-definition/>
- <https://www.slideshare.net/ImranNurManik/colligative-properties-of-dilute-solutions-manik>
- <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ssgopalganj.in%2Fonline%2FOnline%2520Class%2520520PPT%2FCClass%252012%2FCChemistry%2Fch%25205%2520ppt%2520surface%2520chemistry.pptx&wdOrigin=BROWSELINK>
- <https://ccsuniversity.ac.in/bridge-library/pdf/Engg-AG-Engg-Chem-2nd-sem-subodh-Lecture-5.pdf>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

Dr. K. Shenbagam, Assistant Professor, Department of Chemistry

Semester V	InternalMarks:25		ExternalMarks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UCH5DSE1A	NUCLEAR AND INDUSTRIAL CHEMISTRY	DISCIPLINE SPECIFIC ELECTIVE - I	5	4

Course Objective:

- To impart knowledge about radioactivity and nuclear chemistry.
- To provide knowledge about industrial chemistry.

Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall subatomic particles, isotopes, isobar, isotones, magic number, fuels and fertilizers.	K1, K2
CO2	Interpret nuclear reaction, radioactive decay and types of hardness.	K3
CO3	Analyze pesticides, insecticides, fertilizers, fuels and radioactive isotopes.	K3
CO4	Describe stability of nucleus, radioactive series, DDT, BHC, LPG and zeolite process.	K3
CO5	Illustrate nuclear models, radioactive series, characteristics of pesticides, fertilizers and estimation and removal of hardness	K3

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	1	3
CO2	3	2	2	3	2	2	3	3	3	2
CO3	3	3	3	1	2	3	2	2	2	3
CO4	3	3	3	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	3	3

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	CONGNITIV E LEVEL
I	UNIT-I: Introduction to nuclear chemistry: Nucleus- subatomic particles - nuclear forces (Meson theory)- nuclear size – density -stability of nucleus- n/p ratio, curves, stability belts - Whole number rule- binding energy, mass defect -magic number-structure of nucleus- Shell model and Liquid drop model- Nuclear reaction (capturing, particle – particle and spallation reactions). Nuclear fission - nuclear fusion reaction – theories - characteristics features - comparison between nuclear reaction and chemical reaction.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	UNIT-II: Radioactivity: Natural radioactivity - Radioactive decay- α , β , γ decay, Detection and measurement of radioactivity (Geiger Muller and ionization counter) - radioactive series - group displacement law Rate of disintegration and half - life period - Average life period. Artificial radioactivity - Artificial radioactivity - induced radioactivity - uses of radioisotopes - hazards of radiations - nuclear reactors - nuclear fusion - thermo nuclear reactions - energy source of the sun and stars.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	UNIT-III: Agricultural Industries: Plant Nutrient- Micro and macro nutrients. Fertilizer: manufacturing of NPK- Complex fertilizers - mixed fertilizers – manufacturing – composition - Pesticides- classification based on origin -chemical structure - target pest - General methods of application – toxicity - safety measures in using pesticides - preparation properties - uses of organic pesticides – DDT and BHC.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3

IV	UNIT -IV: Industrial fuels: Coal power industries-composition - manufacturing - applications of water gas and producer gas - petroleum refining - chemicals from petroleum refining - natural gas - LPG - petrol - diesel - air pollution problems due to automobiles - remedial measures to control pollution - conversion of coal power into petroleum oil by Fischer-Tropsch and Bergius method - power alcohol -composition and uses.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	UNIT-V: Industrial water treatment: Hard water and industries - industrial water treatment – problems due to hardness in boiler feed water - determination of hardness of water - Titration method - complexometric method using EDTA - expressing hardness - equivalents of calcium carbonate - water softening methods - Clark’s process - permutit or zeolite process - ion exchange process and reverse osmosis.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	Self-study: (Not included for End Semester examination) Toxicity, threshold limit, manufacturing of power alcohol, case studies on nuclear accident, nuclear bomb. Chemistry paper industries, engineering materials used in industries.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Stocchi, E. Lott, K.A.K. and Short, E.L. (1990). Industrial Chemistry, Vol-I, U.K, Ellis Horwood Ltd.
2. Arnikar, J.H. (2022), Essentials of Nuclear chemistry (5th Ed), New Delhi, New Age International Private Limited.
3. Sharma, B.K. (2014), Industrial Chemistry (17/e Ed), Goel Publishing House

Reference Book:

1. Gurdeep Raj. (2016), Advanced Physical Chemistry, (4th Ed), Meerut, Krishna prakashan media.
2. Puri, Sharma & Pathania (2018) Principles of Physical Chemistry (47th Ed), Jalandhar, Vishal

publication.

3. Samir Sakar, (2009), Fuels and Combustion, (3rd Ed), India, Universities Press.

Web Reference:

1. https://onlinecourses.nptel.ac.in/noc23_cy21/preview
2. <http://www.nou.ac.in/econtent/Msc%20chemistry%20paper%202/MSc%20Chemistry%20Paper-II%20Unit-2.pdf>

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo,
Quiz and Seminar

Course Designers

Dr. V. Sangu.

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCH5DSE1B	BASICS OF NANOSCIENCE AND NANOTECHNOLOGY	DISCIPLINE SPECIFIC ELECTIVE – I	5	4

Course Objective

- To know the synthetic methods of nanomaterials.
- To understand the characterization of nanomaterials.
- To understand carbon-based nanomaterials.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the basic concept of nano scale, synthesis and carbon nanomaterials.	K1
CO2	Explicate the synthesis, properties, instrumentation techniques and carbon nanotube.	K2
CO3	Describe quantum materials, top down, bottom up approach, AFM, SEM, CNT, CNF and CNB.	K3
CO4	Analyze the types, properties, size, structure and bonding in nano materials.	K4
CO5	Assess nanomaterials, CVD, TEM, arm chair and Zig zag pattern.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	2	3	3
CO5	3	3	3	2	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamentals of Nanoscience and Nanotechnology Historical perspectives - ancient - medieval - modern periods in nanoscience and nanotechnology - terms and definitions - scale of material - macro - meso - micro and nanoscale - size dependent- classification of nanomaterials - properties of materials - surface and volume - surface energy - band gap in metals - bulk vs nano - quantum nanostructures - importance of nanoscience.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Properties of nanomaterials Thermal properties - melting point - heat capacity- Curie temperature-coefficient of thermal expansion - electrical properties - lattice constant - phase transformation – mechanical properties - elastic modulus - hardness and strength - toughness - optical properties - magnetic properties - biological properties - antimicrobial activity and toxicity.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Synthesis of nanomaterials Synthesis of nanomaterials - top-down and bottom-up approaches - principles and types - physical methods - milling - etching - sputtering - LASER ablation - chemical vapour deposition (CVD) -chemical methods - chemical reduction - precipitation - sol- gel method - solvothermal	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	synthesis - sonochemical synthesis - biological methods - microbial synthesis - phytosynthesis.			
IV	Characterization techniques of nanomaterials Spectroscopic methods - UV-Visible absorption - emission spectroscopy - IR spectroscopy - scanning probe methods: AFM - electron probe methods - SEM - TEM - X-ray methods - particle size determination-Dynamic light scattering method.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Carbon based nanomaterials Structure - bonding in nano material - arm chair - zig-zag - chiral patterns - theory of formation of different structures - growth process of CNT - single walled carbon nano tubes - multi walled carbon nano tubes - graphite - diamond - different types of carbon nano materials - CNF- CNB - structure - properties.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for External Examination) Natural - man-made nanomaterial - significance of nanoscale - synthesis using microorganisms - thermal decomposition of complex precursors - carbon based nano materials - fullerenes - structure - properties of supramolecular assemblies.	-	CO1	K1, K2

Text Books

1. Goyal, R.K., (2018). Nanomaterials and Nanocomposites: Synthesis, Properties, Characterization,

New York: Taylor & Francis Group. CRC Press.

2. Hornyak L.G., Tibbals H.F., Dutta J., and Moore J.J., (2009). Introduction to Nanoscience & Nanotechnology, New York: CRC press. Print.
3. Sharon M., Pandey S., & Oza G., (2012). Bionanomaterials: Concepts and Applications, New Delhi: Ane Books Pvt. Limited. Print.
4. Kumar N., & Kumbhat S., (2016). Essentials in nanoscience and nanotechnology, New Jersey: John Wiley & Sons., Inc.

Reference Books

1. Balaji, S., (2010). Nanobiotechnology, Chennai: MJP Publishers. Print.
2. Cao, G. & Wang, Y., (2011). Nanostructures and Nanomaterials: (Synthesis, Properties and Applications),
New Delhi: World Scientific Publishing Co. Pvt. Ltd. Print.
3. Poole, C.P., & Owens F.J., (2010). Introduction to Nanotechnology, New Delhi: John Wiley and Sons (Asia) Pvt. Ltd. Print.

Web References

1. https://drive.google.com/file/d/1KXRfV11_ydF02BG43kLyQ2cds1nKQ4Y/view
2. https://drive.google.com/file/d/1OhqFIDLhatyUEl1wA4-Xvn_AuV3hQiz6/view
3. https://drive.google.com/file/d/1vq9hJo_2znn9oxqkIasgwccsCyURzAnM/view
4. <https://drive.google.com/file/d/1LUQswFQs60brycdtVd2uo1RHsEYGlfx/view>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

Dr. P. Thamizhini

Semester V	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UCH5DSE1C	POLYMER CHEMISTRY	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives

- To enrich the knowledge in the chemistry of polymers.
- To study the concepts of polymerization and techniques
- To emphasize the impact of less toxic polymers for sustainable development

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall polymers terms, properties, glass transition temperature melting point of polymers.	K1
CO2	Illustrate the preparation, properties and applications of polymers	K2
CO3	Acquaint various polymer processing technologies and molding techniques.	K3
CO4	Analyze the mechanisms of the reactions that lead to the formation of polymers	K4
CO5	Implantation of polymer applications to improve socio economic facts	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	3	2	3	3	3	3	2	2	2
CO3	2	3	3	3	3	2	3	3	3	2
CO4	3	3	2	3	2	3	2	2	2	2
CO5	2	3	1	2	3	3	3	3	2	3

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Polymers Definition of monomer, polymer and polymerization – classification of polymers on the basis of sources and applications - thermosetting and thermoplastics. Functionality and degree of polymerization. Types of polymerization reactions: Chain polymerization - free radical and ionic polymerization – coordination polymerization- step polymerization polyaddition – polycondensation - ring opening - group transfer – electrochemical – metathetical polymerization.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Tacticity, Properties and Reactions of Polymers Tacticity in polymers- Isotactic, syndiotactic and atactic polymers - Glass transition temperature (T_g) -factors affecting T_g . Relationship between T_g and M_n , T_g and T_m -Importance of T_g . Molecular weight of polymer - number average (M_n) - weight average (M_w). sedimentation - viscosity average molecular weights. Reactions - Hydrolysis – hydrogenation – addition – substitutions – cross linking and cyclisations reaction. Polymer degradation- thermal, photo and oxidation degradation of polymers (basics only)	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

III	Polymerization Techniques and Moulding Technique Bulk –solution - emulsion - melt condensation - interfacial polycondensation – plasma polymerization – polymerization in supercritical fluids. Moulding techniques – Injection – compression - extrusion - rotational - calendaring.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Chemistry of Commercial Polymers Preparation, properties and uses of the polymers – polyethylene- polypropylene – polystyrene – PVC – Teflon – polymethylmethacrylate – polycarbonate – polyurethanes - polyamides (Kevlar) - phenol- formaldehyde - urea-formaldehyde resin - epoxy resins - rubber-styrene - neoprene rubbers.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Biopolymers and Recycling of plastic waste Biopolymer films – biodegradable mulching-properties – uses - disadvantages of biodegradable polymers- applications of biopolymers in horticulture Food Packaging - nanocomposite films - coating - preparation - uses of PHBV- PGA- PLA – PCL- steps involved in recycling of plastics.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Polydispersity and polydispersity index of polymers. Examples of monodispersed and polydispersed polymers. Molecular mass & mechanical properties. Size of polymer molecules.	-	CO1 CO2 CO3 CO4	K1 K2 K3 K4

Text Books

1. Gowariker V.R., Viswanathan N.V. and Jayadev Sreedhar, (1978). Polymer Science
Wiley Eastern Ltd., New Delhi
2. Sharma, B.K, 1989, Polymer Chemistry, Goel Publishing House, Meerut.
3. Premamoy Ghosh, 2011, Polymer Science and Technology, 3rd edition, Tata McGraw
Hill Education Private Limited, New Delhi.
4. George Odian, 2004, Principles of Polymerization, 4th edition, John Wiley and Sons, New York.
5. F. W. Billmeyer, Text book of Polymer Science, 3rd edition, John Wiley & Sons

Reference Books

1. Arora M.G., Singh, M. and Yadav M.S (1989), Polymer Chemistry, 2nd Revised edition, Anmol Publications
Private Ltd., New Delhi.
2. Joel R. Fried, 2014, Polymer Science and Technology, 3rd Edition, Pearson.
3. Anilkumar & S.K. Gupta, 2020, Fundamentals of Polymer Science and Engineering, Tata McGraw
Hill, New Delhi

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

1. Dr. R. Subha

Semester: V	InternalMarks:40		ExternalMarks:60	
COURSECODE	COURSETITLE	CATEGORY	Hrs /Week	CREDITS
22UCH5SEC2P	WATER ANALYSIS (P)	SKILL ENHANCEMENT COURSE-II	2	2

Course Objective:

1. To learn the techniques of titrimetric analyses.
2. To know the estimation of several cations and anions
3. To know the estimation of total hardness of water.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the basic principles of volumetric analysis and estimation	K1, K2
CO2	Estimate water quality parameters such as dissolved oxygen content, chloride content of the water samples.	K3
CO3	Interpret quality of water from the experimentally measured values.	K3
CO4	Exhibit ethical principles in engineering practices	K3
CO5	scientifically plan and perform experiments to estimate water quality parameters.	K3

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight (Low)Correlation

“3”–Substantial (High)Correlation

“2”–Moderate(Medium)Correlation

“-”indicates there is no correlation

Syllabus

1. Determination of total hardness of water by EDTA method.
2. Determination of methyl orange alkalinity of water.
3. Determination of phenolphthalein alkalinity of water.
4. Determination of chloride content of water by argentometric method.
5. Estimation of dissolved oxygen in water by Winkler's method.
6. Estimation of chemical oxygen demand of water.
7. To determine the TDS of a given sample of water.
8. Determination of Phosphates in given water sample.
9. Determination of Sulphates in given water sample.

Text Book:

1. Khanna, D.R. Bhutiani, R. Daya. (2008). Laboratory Manual of Water and Wastewater Analysis, New Delhi, Publishing House.
2. Venkateswaran, V. Veeraswamy, R. Kuandaivelu. (1997). Basic Principles of Practical Chemistry. 2nd edition. New Delhi, Sultan Chand & Sons

Reference Book:

1. Vogel A. I. (2000). Text book of quantitative inorganic analysis. The English language book Society.

Web Reference:

1. <http://www.titrations.info/EDTA-titration-calcium>
2. <https://www.youtube.com/watch?v=qmVQs6Q7tso>
3. <https://srmvalliammai.ac.in/wp-content/uploads/2022/05/1903610-water-and-waste-water-analysis-laboratory-manual.pdf>
4. https://youtu.be/Lp_O8dolCXk
5. <https://youtu.be/zXvEmlFqicw>
6. <https://youtu.be/Sa0WfA9UGG0>
7. <https://youtu.be/6QsRkG5jy90>
8. <https://youtu.be/ve53HN9za7E>

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo, Quiz and Seminar

Course Designers

Dr.V. Sangu.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC
ISO 9001:2015 Certified
TIRUCHIRAPPALLI

PG and RESEARCH DEPARTMENT OF CHEMISTRY



M.Sc. CHEMISTRY
SYLLABUS
2023 - 2024 and ONWARDS

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG and RESEARCH DEPARTMENT OF CHEMISTRY

VISION

- To progress into a centre of superiority in chemistry that will blend state-of-the-art practices in professional teaching in a communally enriching way, with the holistic progress of the students as its prime emphasis.

MISSION

- To produce graduates committed to integrity, professionalism and lifelong learning by widening their knowledge horizons in range and depth.
- To awaken the young minds and discover talents to achieve personal academic potential by creating an environment that promotes frequent interactions, independent thought, innovations, modern technologies and increased opportunities.
- To enhance the quality through basic and applied research frameworks, and encourage the students to take part in entrance and competitive examinations for higher studies and career.
- To enhance services to the community and build partnerships with the industry.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	STATEMENTS
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc. Mathematics, M.Sc. Physics,
M.Sc. Chemistry PROGRAMME

PO No.	Programme Outcome On completion of M.Sc. Programme, the students will be able to
PO1	Problem analysis: Provide opportunities to develop innovative design skills, including the ability to formulate problems, to think creatively, to synthesize information, and to communicate effectively.
PO2	Scientific skills: Create and apply advanced techniques and tools to solve the societal environmental issues.
PO3	Environment and Sustainability: Ascertain eco-friendly approach for sustainable development and inculcate scientific temper in the society.
PO4	Ethics: Imbibe ethical and social values aiming towards holistic development of learners.
PO5	Lifelong learning: Instill critical thinking, communicative knowledge which potentially leads to higher rate of employment and also for higher educational studies.

PROGRAMME SPECIFIC OUTCOMES FOR M.Sc. CHEMISTRY

PSO No.	Programme Specific Outcomes Students of M.Sc., Chemistry will be able to	POs Addressed
PSO1	Acquire knowledge in basic concepts, fundamental principles, and applications of chemical and scientific theories and their relevancies in the day-to-day life.	PO1 PO2
PSO2	Design experiments, analyze, synthesize and interpret data to provide solutions to different industrial problems by working in the pure, inter and multi-disciplinary areas of chemical sciences.	PO1 PO2 PO3
PSO3	Attain maneuver in diverse contexts with global Perspective.	PO3 PO4
PSO4	Gain a thorough Knowledge in the subject to be able to work in projects at different research as well as academic institutions.	PO1 PO2 PO5
PSO5	Afford Global level research opportunities to pursue Ph.D. programme targeted approach of CSIR - NET examination.	PO1 PO2 PO3 PO4 PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG DEPARTMENT OF CHEMISTRY

M.Sc. CHEMISTRY

(For the Candidates admitted from the Academic year 2023 - 2024 and onwards)

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
II	Core Course– IV (CC)	Physical Chemistry – I	23PCH2CC4	6	5	3	25	75	100
	Core Practical – II (CP)	Inorganic Chemistry – I (P)	23PCH2CC2P	6	5	6	40	60	100
	Core Choice Course– I (CCC)	A. Organic Reaction Mechanism – II	23PCH2CCC1A	6	4	3	25	75	100
		B. Chemistry of Natural Products	23PCH2CCC1B						
		C. Molecular Rearrangement	23PCH2CCC1C						
	Core Practical – III (CP)	Physical Chemistry– I (P)	23PCH2CC3P	6	5	6	40	60	100
	Discipline Specific Elective Course-II (DSE)	A. Green Chemistry	23PCH2DSE2A	6	3	3	25	75	100
		B. Forensic Chemistry	23PCH2DSE2B						
		C. Analytical Chemistry	23PCH2DSE2C						
	Internship	Internship	23PCH2INT	-	2	-	-	100	100
Extra Credit Course	SWAYAM	As per UGC Recommendation							
	Total			30	24				600

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
23PCH2CC4	PHYSICAL CHEMISTRY - I	CORE	6	5

Course Objectives

- To understand quantum mechanical operators, thermodynamic probability.
- To understand and compare theories of chemical kinetics.
- To learn symmetry operation and point group of simple molecules.
- To predict the vibrational modes, hybridization using the concepts of group theory.

Prerequisites

Schrodinger equation, factors affecting rate of the reactions, probability, entropy, adsorption, absorption and adsorption isotherm.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Recall postulates of quantum theory- operator- thermodynamic probability- and types of adsorption.	K1, K2
CO2	Solve Schrodinger equation, character table, various statistical models, theories of reaction rate and surface theories.	K3, K4
CO3	Explain Hermitian of operators, theories of unimolecular reactions, ensembles and microstates.	K4
CO4	Deduce wave equation for particle in a box, rigid rotor, harmonic oscillator, classical and quantum statistics.	K5
CO5	Evaluate angular and radial function, character table, unimolecular reactions and kinetic models for catalysis	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	1	3
CO2	3	2	2	3	2	2	3	3	3	2
CO3	3	3	3	1	2	3	2	2	2	3
CO4	3	3	3	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Quantum Chemistry: Quantum mechanical operators - linear and non-linear operators - Hermitian operators - postulates of quantum mechanics - time dependent and independent Schrodinger wave equation - solution of the Schrodinger equation for bounded states such as particle-in-one dimensional - box - harmonic oscillator - rigid rotor - solution of the Schrodinger equation for the hydrogen atom - radial - angular probability distributions - atomic orbitals - electron spin.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Group Theory: Definition of a mathematical group - properties - group multiplication table - cyclic groups - subgroups - classes - symmetry elements - symmetry operation - determination of point group of simple molecules (H_2O , CO_2 , NH_3 , BF_3 , HCHO , C_2H_4 and XeF_4 like molecules) - definition of reducible and irreducible representations - great orthogonality theorem - consequences (statement only proof not needed) - determinations of the characters for irreducible representation of C_{2v} - C_{3v} point groups using the orthogonality theorem to construct the character table.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

III	Chemical Kinetics: Theories of reaction rates - Arrhenius theory - hard - sphere collision theory of gas - phase reactions - activated complex theory or absolute reaction rate theory (ARRT) for ideal gas reactions (in terms of partition functions) - relation between activated complex theory and hard sphere collision theory - thermodynamic formulations of activated complex theory - Lindeman's - Hinshelwood theory of unimolecular reactions.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Catalysis and surface phenomenon: Homogenous and heterogeneous catalysis - effect of pH - temperature on enzyme catalysis - kinetics of heterogeneous catalysis - Langmuir - Hinshelwood and Langmuir - Rideal - Eley mechanism - adsorption - free energy relation at interfaces - Gibb's adsorption isotherm - physisorption – chemisorption - adsorption isotherms - Freundlich, - Langmuir.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Statistical Thermodynamics: Thermodynamic probability - most probable distribution - ensemble - postulates of ensemble overlapping - canonical - grand canonical - micro canonical ensembles - sterling approximation derivation - Maxwell-Boltzmann distribution law - Maxwell's distribution of molecular velocity - Maxwell-Boltzmann statistics - applications - Bose-Einstein - Fermi Dirac	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

	statistics - comparison of MB, FD and BE statistics			
VI	Self-study: (Not for final examination) Eigen value - eigen function - applications of quantum mechanics - black body radiation - photoelectric effect - hydrogen spectrum - need for quantum mechanics - postulates.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Text Books

1. Prasad, R. K. (2006). Quantum Chemistry (3rd ed), New Delhi, New Age International Publishers.
2. Bhattacharya, P.K. (2014). Group Theory and its Chemical Application, New Delhi, Himalaya Publishing House.
3. Laidler, K.J. (2003). Chemical Kinetics (3rd ed), India, Pearson Education.
4. Gupta, M.C. (2003). Statistical Thermodynamics (2nd Ed), New Delhi, New Age International Publishers.
5. Puri, Sharma & Pathania (2018) Principles of Physical Chemistry (47th Ed), Jalandhar, Vishal publication.

Reference Books

1. McQuarrie, D. A. (2015). Quantum Chemistry, India, Viva Books.
2. Chandra, A.K. (1994), Introduction to Quantum Chemistry, (4th Ed.), India, Tata-McGraw-Hill.
3. Mahendra R. Awode (2002) Quantum Chemistry, (New Delhi), S. Chand and Co. Ltd.
4. Raj, G. Bhagi, A. and Jain, V. (2010). Group Theory and Symmetry in Chemistry, (3rd Ed.), India, Krishna Prakashan.
5. Gurdeep Raj. (2016), Advanced Physical Chemistry, (4th Ed), Meerut, Krishna prakashan media.
6. Raman, K.V. (1990), Group theory and its applications to chemistry (3rd Ed), McGraw-Hill Education.

Web References

1. [e-PG Pathshala – P-02- Physical Chemistry- I \(Quantum Chemistry\)](#)
2. [e-PG Pathshala – P-06- Physical Chemistry- I \(Statistical thermodynamics, chemical](#)

dynamics, electrochemistry)

3. https://www.bdu.ac.in/cde/SLM/M.Sc.%20Chemistry/Chemistry%20I%20Year/Physical_Chemistry/Unit1.doc.
4. <https://youtu.be/ALwziZSRiqM>
5. <https://youtu.be/ACY-Wbudg0o>
6. <https://youtu.be/yO8v0nszUz8>
7. <https://nptel.ac.in/courses/104101124>
8. <https://ipc.iisc.ac.in/~kls/teaching.html>

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo, Quiz, and seminar

Course Designer

- Dr. V. Sangu

Semester II	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
23PCH2CC2P	INORGANIC CHEMISTRY - I (P)	CORE	6	5

Course Objectives

- To perform the semi-micro qualitative analysis and to estimate the metal ions using photoelectric colorimeter.
- To examine the constituents of samples.

Prerequisites

Separation of cations and anions, quantitative analysis

Course outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Detection of ions in an aqueous solution of the salt.	K2
CO2	Explain the quantitative estimation and estimation of inorganic compounds.	K3
CO3	Identify and separate cations and anions in a sample substance and Interpret results, while observing responsible and scientific conduct.	K3
CO4	Analyze quantitatively inorganic components in the environment.	K4
CO5	Hands-on experience with technical instrumentation.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	2	1	3	2	1
CO2	2	3	2	2	2	3	2	1	3	2
CO3	2	3	2	2	2	1	1	1	2	2
CO4	2	3	2	2	2	2	1	2	2	1
CO5	2	3	2	2	2	1	1	1	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation.

SYLLABUS

1. Semi-micro qualitative analysis of a mixture containing two common cations (Pb, Bi, Ca, Cd, Fe, Cr, Al, Co, Ni, Mn, Zn, Ba, Sr, Ca, Mg,) and two less common cations (W, Tl, Se, Te, Mo, Ce, Th, Zr, Ti, V, U, Li).
2. Quantitative Estimation of copper, iron, nickel, chromium and manganese ions using photoelectric colorimeter.

Text Book

1. Vogel. A. I (2000), Text Book of Quantitative Inorganic Analysis, Longman.
2. Ramanujam, V.V. (1988), Inorganic Semimicro Qualitative Analysis, National Pubs.
3. Svehla. G. (1987), Text Book of Macro and Semimicro Qualitative Inorganic analysis, Longman.

Reference book

Vogel, A. I Tatchell. A.R, Furniss B.S, Hannaford.A. J &Smith, P. W. G, (1989), Vogel's Textbook of Practical Organic Chemistry, 5th Ed., Prentice Hall.

Web References

1. https://iscnagpur.ac.in/study_material/dept_chemistry/4.1_MIS_and_NJS_Manual_f_or_Inorganic_semi-micro_qualitative_analysis.
2. <https://byjus.com/chemistry/systematic-analysis-of-cations.>
3. <https://www.uou.ac.in/sites/default/files/slm/MSCH-505L.pdf>

Pedagogy

E-content, Demo, Hands on training

Course Designer

- Dr. K. Shenbagam

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
23PCH2CCC1A	ORGANIC REACTION MECHANISM-II	CORE CHOICE COURSE	6	4

Course Objectives

- To learn about the oxidising and reducing agent.
- Enable the students to acquire surplus knowledge about the addition, elimination mechanism, pericyclic reactions and the chemistry behind the photolytic reactions.
- Guide the students to know the role of heterocyclic compounds in drug development.

Prerequisites

Addition, Elimination, cycloaddition, photoreaction and Heterocycles.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Outline the synthesis, reactivity of organic compounds, nature of reagents, and fundamentals of photochemistry.	K1 & K2
CO2	Interpret the reaction mechanism of various organic reactions including photochemical, pericyclic, redox and heterocycles.	K3
CO3	Classify the different types of addition, elimination, photolytic reactions and heterocyclic compounds.	K4
CO4	Categorize the reaction pathways and naming reactions.	K5
CO5	Predict the mechanism and products of organic reactions.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	2	1	1	3
CO2	3	2	1	3	2	3	3	1	1	2
CO3	3	3	2	1	2	3	3	2	2	3
CO4	3	3	2	2	3	3	3	2	2	3
CO5	3	3	2	3	3	3	2	1	1	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Addition and Elimination: Addition to carbon - carbon multiple bonds – electrophile - nucleophile - free radical addition - addition to carbonyl - conjugated carbonyl system with mechanisms - Knoevengal - Stobbe - Darzen's glycidic ester condensation - Reformatsky reaction - elimination reaction - mechanism of E1, E2, E1CB – stereochemistry - Hoffmann's - Zaitsev's rules - pyrolytic cis elimination - Chugaev reaction - Hoffmann exhaustive methylation - Cope elimination - Bredt's rule.	18	CO1, CO2, CO4, CO5	K1, K2, K3, K4, K5
II	Organic Photochemistry: Fundamental concepts - energy transfer - characteristic of photoreaction - photoreduction- photooxidation – photosensitization - classification of photo reactions of Ketones - enones - Norrish type I and II - Paterno-Buchi reaction - photo-Fries rearrangement - photochemistry of alkenes - aromatic compounds – Zimmerman's di-pi methane rearrangement - reaction of unactivated centres- photochemistry of α , β - unsaturated carbonyl compounds - Barton Reaction.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Pericyclic Reactions: Concerted reactions- stereochemistry - orbital symmetry - correlation diagram - Frontier molecular orbital approach- Woodward-Hoffmann rules- electrocyclic reactions - cycloaddition reactions- selection rules -	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

	sigmatropic rearrangements- selection rules with examples- 1,3 and 1,5 hydrogen shifts - Cope - Claisen rearrangements.			
IV	Reagents in Organic Synthesis: Oxidation- Baeyer-Villiger-Jacobsen epoxidation - Shi epoxidation- Jones reagent-PCC-PDC-IBX-DMP-CAN-Cu(OAc) ₂ -Bi ₂ O ₃ -Swern oxidation- Sommelet reaction- Elbs reaction- oxidative coupling -Prevost reaction - Woodward modification - reduction-palladium - platinum - rhodium - nickel based heterogeneous catalysts for hydrogenation -Wilkinson's catalyst -Noyori asymmetric hydrogenation- Luche reduction- Red-Al- NaBH ₄ -NaCNBH ₃ - trialkylsilanes - trialkylstannane.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Heterocycles: Nomenclature - synthesis - reactivity of aromatic heterocycles - pyrazole- isothiazole- triazole- pyrimidine- purines- triazines- pyridazines – pyrazines - synthesis - reactivity of non-aromatic heterocycles - tetra hydro furan- pyrrolidine - piperidine- oxirane- oxetane- oxazole -imidazole.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-Study for Enrichment: (Not to be included for External Examination) Markovnikov's - Anti-Markovnikov's rule - syn-anti addition – elimination - Jablonski diagram - thermal - photochemical reactions - chemistry of simple heterocycles.	-	CO1, CO2, CO3	K1, K2, K3, K4

Text Books

1. Pine S.H, Hendrickson J B, Cram and Hammond, (1980), Organic Chemistry, McGraw Hill, New York, 4th edition.
2. March J, and Smith M.B,(2020), Advanced Organic Chemistry, Reactions, mechanisms and Structure, Wiley, 8th edition.

3. Carey F A and Sundberg R J,(2007), Advanced Organic Chemistry, Part A and Part B, Springer,5th Corrected edition.
4. Bansal. R .K, (1990), Reaction mechanism in Organic Chemistry, Tata McGraw Hill.
5. Finar I L, (2009), Organic Chemistry, Pearson Education Ltd., 6th edition.

Reference Books

1. Peter sykes (2009), A guide book to mechanism in Organic Chemistry, Pearson Education, 6th edition.
2. Raj K Bansal. (2009), Heterocyclic Chemistry, New Age International Publishers. 4th edition.
3. Gurdeep.R.Chatwal, (2015), Reaction Mechanism and Reagents in Organic Chemistry, Himalaya Publishing House.

Web References

1. <https://www.chemistrylearner.com/addition-reaction.html>.
2. <http://www-oc.chemie.uni-regensburg.de/OCP/ch/chb/oc5/Photochemie-08.pdf>.
3. https://edscl.in/pluginfile.php/2878/mod_resource/content/1/teachers%20notes.pdf.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

- Dr. A. Sharmila

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
23PCH2CCC1B	CHEMISTRY OF NATURAL PRODUCTS	CORE CHOICE COURSE	6	4

Course Objectives

- By the end of this course, the student will be familiar with definition, isolation and uses of natural products.
- The students will be able to know the general properties and methods of preparation of natural products chemically and biosynthetically.

Prerequisites

Isolation, addition, elimination, substitution, oxidation, reduction reactions.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Differentiate the different types of alkaloids, terpenes, steroids, flavonoids and vitamins.	K1
CO2	Know the basic terms in natural product chemistry and their physiological significance.	K2
CO3	Evaluate the different methods of preparation of natural products.	K3
CO4	Recognize the most important building blocks employed in the biosynthesis of natural products.	K4
CO5	Elaborate general methods of structural elucidation of compounds of natural origin.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	3	3	2	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	1	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Alkaloids: Categorization of alkaloids- general methods of structural determination of alkaloids -synthesis - biogenesis of nicotine - quinine – morphine - atropine - serotonin.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Terpenoids and Carotenoid: Classification of terpenoids - isoprene rules- structural elucidation - synthesis of geraniol- α -pinene - camphor - diterpenoids - carotenoid- introduction - structure - synthesis of β -carotene - lycopene.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Steroids: Introduction - nomenclature of steroids - Blanc's rule - Barbier-Wieland degradation - oppenauer oxidation - Diel's hydrocarbon - chemistry of cholesterol - ergosterol -Vitamin-D.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Flavonoids and Isoflavonoids: Occurrence, nomenclature and general methods of structure determination, isolation - structure elucidation -synthesis of kaempferol - quercetin - cyanidin- genestein.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Vitamins: Classification - structure of water soluble - fat-soluble vitamins - plant and animal sources- vitamins as coenzymes-deficiency of vitamins and their effects.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self-Study for Enrichment: (Not to be included for External Examination) Definition - isolation and purification of alkaloids- terpenes - flavonoids.	-	CO2, CO3	K2, K3

Text Books

1. Chatwal G.R, (1990), Natural Products Chemistry-Vol. I & II, Himalaya Bombay.
2. Agarwal, O.P, Goel Gorakhpur (1985), Chemistry of Natural Products-Vol. I & II:
3. Longmann E.L, London B.S, (2000), Organic Chemistry-Vol. I-II: I. L. Finar.
4. Sujatha V. Bhat, Nagasampige B.A & Sivakumar M, (2006), Chemistry of Natural Products:, 2nd reprint, Springer.

Reference Books

1. Dewick P.M (2009), Medicinal Natural Products: A Biosynthetic Approach", 2nd Edition, Wiley& Sons.
2. Graham Solomons T.W, Craig B. Fryhle, Scott A. Snyder (2013), Organic Chemistry, 11th Edition, International Student Version, John Wiley & Sons. Himalaya Publishing House.

Web References

1. <https://chemnote.weebly.com/uploads/2/5/8/6/25864552/alkaloids.pdf>.
2. <https://www.vedantu.com/biology/steroid>.
3. <https://www.slideshare.net/TareqAspirant/a-short-note-on-vitamins>.
4. <https://www.tuscany-diet.net/2014/01/22/flavonoids-definition-structure-classification>.
5. <https://www.intechopen.com/chapters/62573>.
6. <https://gcwgandhinagar.com/econtent/document/1588068142ch-1.pdf>.

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

- Dr. C. Rajarajeswari

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
23PCH2CCC1C	MOLECULAR REARRANGEMENT	CORE CHOICE COURSE	6	4

Course Objectives

- To learn about the reactions intermediates involved in rearrangement reactions.
- To learn about the basic concepts about the electrophilic and nucleophilic rearrangement reactions.
- To learn the concept and mechanism of rearrangement reactions.

Prerequisites

Reaction intermediates, nitrenes, carbenes, electrophilic, nucleophilic, naming reactions.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Know the outline for determining nature of rearrangements.	K1, K2
CO2	Interpret the reaction mechanism in various organic reactions.	K2
CO3	Classify the different types of intermediates involving in organic rearrangement reactions.	K3
CO4	Recognize the technique of identifying reaction mechanism in various naming reactions.	K4
CO5	Predict the mechanism, different intermediates and product of molecular rearrangement reactions.	K5

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	3	3	2	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	1	3

Mapping of CO with PO and PSO

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Molecular Rearrangements: Introduction - intermolecular - intra molecular rearrangement - intermediates - classification based on migration origin and migration terminus - rearrangement to electron - deficient carbon - Wagner - Meerwein rearrangement - pinacol rearrangement - Wolff rearrangement - benzyl - benzylic acid rearrangement - allylic rearrangement - Sommelet - Hauser rearrangement - Tiffeneau - Demjanov rearrangement.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Rearrangement to electron-deficient nitrogen: Beckmann rearrangement - Schmidt rearrangement - Hofmann rearrangement - Curtius rearrangement - Lossen rearrangement - Neber rearrangement - Stieglitz rearrangement - rearrangements with acyl carbenes - Arndt-Eistert Reaction - diazo ketone reactions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Rearrangement to electron-deficient oxygen: Baeyer - Villiger oxidation - cumene hydroperoxide rearrangement - phenol rearrangement - Dakin reaction - free radical rearrangements - sigmatropic rearrangement – classification - [1,2] shift - [1,3] shift - [3,3] shift - Claisen rearrangement - Cope rearrangement.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

IV	Migration from N- to ring carbon rearrangement: Hoffmann Martius rearrangement - Orton rearrangement - benzidine - semidine rearrangement - Bamberger rearrangement - migration to electron rich carbon center - Fries rearrangement - Favorski rearrangement.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Free radical rearrangement Introduction - addition - substitutions - fragmentations - homolysis and free radical displacement - Hunsdieker reaction - Birch reduction - acyloin condensation – Homobenzylic rearrangement - Barton rearrangement- Hoffmann-Löffler-Freytag reaction.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment: (Not to be included for External Examination) Aldol condensation - allylic rearrangement - Ullmann reaction - Sandmeyer reaction - Perkin reaction - photochemical reaction - thermal fission reaction - oxidation - reduction reaction.	-	CO1, CO2	K1, K2, K3

Text Books

1. Tewari, .K.S, Vishil, N.K, & Mehotra N.S (2001), A text book of org. chem – 1st edition, Vikas Publishing House Pvt Ltd., New Delhi.
2. Soni P.L (2005), Text Book of Organic chemistry, Sultans Chand, 1991, New Delhi.
3. Bahl & Arun Bahl (2005), Organic Chemistry, S. Chand and Sons, New Delhi.
4. Agarwal O.P (2002), Chemistry of Organic Natural Products, Vol 1 and 2, Goel Pub. House.
5. Gurdeep Chatwal (2002), Chemistry of Organic Natural Products, Vol 1 and 2, Goel Pub. House.

Reference Books

1. Sharma, Y.R. & Vig O.P (1997), Elementary organic absorption spectroscopy – 1st edition, Goel Pulishers, Meerut.
2. Morrison R.T & Boyd R.N (1992), Organic Chemistry, 6th edition, PHI Limited, New Delhi.
3. Jerry March (1992), Advanced Organic Chemistry, 4th edition, John Wiley and Sons, New York.
4. Pine S.H (1987), Organic Chemistry, 5th edition, McGraw Hill International Edition, Chemistry Series, New York.

Web References

1. https://tmv.ac.in/ematerial/chemistry/kpb/SEM_IV_Honours_Rearrangement%20final.pdf
2. <https://pt.slideshare.net/ranianjali/molecular-rearrangements-involving-electron-deficient-nitrogen-as-an-intermediate>
3. https://tmv.ac.in/ematerial/chemistry/kpb/SEM_IV_Honours_Rearrangement.pdf
4. <https://www.slideshare.net/RakeshAmrutkar/molecular-rearrangement-182395340>
5. <https://www.slideshare.net/VIKASMATHAD1/free-radicals-84891258>

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

- Dr. K. Uma Sivakami

Semester II	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
23PCH2CC3P	PHYSICAL CHEMISTRY - I (P)	CORE	6	5

Course Objectives

- To understand the principle of conductivity experiments through conductometric titrations.
- To evaluate the order of the reaction, temperature coefficient, and activation energy of the reaction by following pseudo first order kinetics.
- To construct the phase diagram of two component system forming congruent melting solid and find its eutectic temperatures and compositions. To determine the kinetics of adsorption of oxalic acid on charcoal.

Prerequisites

Basic knowledge in electrochemistry, kinetics, phase rule and adsorption theories.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statements	Cognitive Level
CO1	Recall the principles associated with various physical chemistry experiments.	K1, K2
CO2	Scientifically plan and perform conductometric, kinetics, rast and adsorption experiments.	K3, K4
CO3	Calculate and process the experimentally measured values and compare with graphical data.	K4, K5
CO4	Interpret the experimental data scientifically to improve students' efficiency for societal developments.	K6
CO5	Comprehend the kinetics and mechanism of substitution reactions in octahedral and square planar complexes.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	3	3	3	3	2	3	3	3	2
CO3	3	3	3	3	3	3	2	3	3	3
CO4	3	3	3	3	3	3	3	2	3	3
CO5	3	3	3	3	3	3	3	2	3	3

“1”– Slight (Low) Correlation

“2”– Moderate (Medium) Correlation

“3”– Substantial (High) Correlation

“-” Indicates there is No Correlation.

SYLLABUS

1. Study the kinetics of acid hydrolysis of an ester to determine relative strength of acids.
2. Study the kinetics of hydrolysis of methyl/Ethyl acetate catalyzed by hydrochloric acid at different temperatures and to determine the thermodynamic parameters.
3. Study the kinetics of the reaction between acetone and iodine in acidic medium by half-life method and determine the order with respect to iodine and acetone.
4. Study of effect of salt (ionic strength) on the kinetics of reaction between potassium persulphate and potassium iodide (second order reaction).
5. Construct the phase diagram of simple eutectic system to determine composition of given mixture.
6. Determine the freezing point curve of two component system forming compound.
7. Determine cryoscopy constant of the given solvent by Rast method.
8. Determination of critical solution temperature of phenol-water system.
9. Study the effect of added electrolyte on the CST of phenol-water system.
10. Adsorption of oxalic acid on charcoal & determination of surface area (Freundlich isotherm only).
11. Determination of molecular weight of the polymer by viscometer method.

Text Books

1. Viswanathan B & Raghavan P.S, (2009). Practical Physical Chemistry, Viva Books, New Delhi.
2. Sundaram, Krishnan, Raghavan, (1996). Practical Chemistry (Part II), S. Viswanathan Co. Pvt.
3. Athawale and Parul Mathur, (2008). Experimental Physical Chemistry, New Age International (P) Ltd., New Delhi.
4. Lewers E.G, (2011) Computational Chemistry: Introduction to the Theory and Applications of Molecular and Quantum Mechanics, 2nd Ed., Springer, New York.

Reference Books

1. Yadav J.B, (2001). Advanced Practical Physical Chemistry, Goel Publishing House.
2. Gurthu, J. N., & Kapoor R, (1987) Advanced Experimental Chemistry, S. Chand and Co.

Web References

1. https://web.iitd.ac.in/~nkurur/2015-16/Isem/cmp511/lab_handout_new.pdf

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo, Quiz and Seminar

Course Designer

- Dr. V. Sangu

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
23PCH2DSE2A	GREEN CHEMISTRY	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To know about twelve principles of green chemistry, eco-friendly synthesis using microwave, ionic liquid and phase transfer catalyst.
- To know the synthesis of organic compounds in greener way.
- To gain knowledge about the use of environmentally friendly practices in reducing pollution.

Prerequisites

Pollution, hazardous chemicals, toxic chemicals. catalyst, condensation, substitution, elimination, oxidation, reduction.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Describe the basics of green chemistry and organic synthesis.	K1
CO2	Understand the importance of solvents, solid-state reactions, phase transfer catalyst and alternative energy sources.	K2
CO3	Apply green synthesis for synthesizing different organic compounds.	K3
CO4	Analyze the applications of green synthesis.	K4
CO5	Create a new route for the synthesis of organic compounds.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	2	2	2	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Green Chemistry: Introduction - need of green chemistry - twelve principles of green chemistry - planning a green synthesis - percentage atom utilization - evaluating the type of the reaction involved - selection of appropriate solvents - selection of starting materials - use of catalyst - international organizations promoting green chemistry.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
II	Organic Synthesis in Green Solvents: Introduction, reactions in water - pericyclic reactions - Claisen rearrangement - Wittig-Horner reaction - Knoevenagel reactions - pinacol coupling - aldol condensation - benzoin condensation - Heck reaction - Wurtz reaction - Mannich reactions - organic synthesis in supercritical carbon dioxide - Diels-Alder reaction - Kolbe-Schmitt synthesis - reaction in ionic liquids - types - preparations - synthetic applications.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4, K5
III	Organic synthesis using ionic liquids: Introduction - types of ionic liquids - preparation of ionic liquids - applications - conversion of epoxides to halohydrins - thiocyanation of alkyl halides - Biginelli reaction - synthesis of homoallylic amines - cyclic carbonates - tonalid - traseolide - 1-acetyl naphthalene - biotransformation in ionic liquids - transesterification reactions - ammoniolysis of carboxylic acids - synthesis of Z-aspartame.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5

IV	Alternate Energy Processes in Chemical Synthesis: Microwave assisted organic synthesis – introduction - reactions in water - Hofmann elimination - hydrolysis of benzyl chloride - benzamide - coupling reactions - reactions in organic solvents - Baylis - Hillman reaction – esterification - Fries rearrangement - synthesis of chalcones - ultrasound assisted organic synthesis - introduction - homogenous sonochemical reactions - Curtius rearrangement - organometallic reactions - addition reactions - heterogenous liquid - liquid reactions - solid-liquid reactions.	18	CO 1, CO 2, CO 3 CO 4, CO 5	K1,K2,K3, K4,K5
V	Phase Transfer Catalysts: Introduction - mechanism of phase transfer reaction - types - advantages of phase transfer catalyst - applications of phase transfer catalyst in organic synthesis - Darzen reaction - Michael addition - Benzoin condensation - Wittig reaction - oxidation reactions using permanganate - chromate - hypochloride - osmium tetraoxide - potassium ferricyanide - peroxides - reduction reactions.	18	CO 1, CO 2, CO 3 CO 4, CO 5	K1,K2,K3, K4,K5
VI	Self-Study for Enrichment: (Not to be included for External Examination) Properties of CO ₂ - Phase diagram for CO ₂ - Uses of CO ₂ in dry cleaning - instrumentation - types of sonochemical reaction in ultrasound assisted green synthesis.	-	CO 1, CO 2	K1,K2

Text Books

1. Kumar, V. (2007) An Introduction to Green Chemistry. Vishal Publishing Co. Jalandhar.
2. Ahluwalia. V. K. An Introduction to Green Chemistry. Narosa Publishing.
3. Anastas. P. T., and Warner, J. C. (2008). Green Chemistry. Oxford University Press.

Reference Books

1. Ahluwalia. V. K., and Kidwai, M. (2007). New Trends in Chemistry. Anamaya Publishers. 2nd Edition.
2. Ahluwalia. V. K., and Varma, R. S. (2009). Green Solvents. Narosa Publishing. 1st Edition.

Web References

1. <https://www.epa.gov/greenchemistry/basics-green-chemistry>
2. [https://www.scielo.br/j/jbchs/a/Fzh57FB7TrhBWRLnzkCCfDs/?lang=en#:~:text=The%20solid%2Dphase%20organic%20synthesis%20\(SPOS\)%20has%20emerge d%20as,chemistry%20to%20discover%20new%20hits.&text=In%20SPOS%2C3%20the%20solid,to%20drive%20reactions%20to%20completion](https://www.scielo.br/j/jbchs/a/Fzh57FB7TrhBWRLnzkCCfDs/?lang=en#:~:text=The%20solid%2Dphase%20organic%20synthesis%20(SPOS)%20has%20emerge d%20as,chemistry%20to%20discover%20new%20hits.&text=In%20SPOS%2C3%20the%20solid,to%20drive%20reactions%20to%20completion)
3. <https://www.organic-chemistry.org/topics/sonochemistry.shtm>
4. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/chemistry/05.organic_chemistry-ii/21.phase_transfer_catalysis/et/5550_et_et.pdf
5. https://doras.dcu.ie/18202/1/Robert_Ryan.pdf

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

- Dr. S. Devi

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
23PCH2DSE2B	FORENSIC CHEMISTRY	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To identify the physical and biological evidences.
- To asset the various system of finger prints, forgery and natural origin.
- To explore the processing and usage of explosives.

Prerequisites

Terminologies, fingerprint, counterfitting, explosions.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify the fundamental principles and functions of forensic science.	K1
CO2	Apply the principles of Spectroscopy in forensic science.	K2
CO3	Analyze the techniques involved in the field of forensics.	K3
CO4	Appraise the role of chemistry and other branches in forensics.	K4
CO5	Feasibility and evaluation of explosives.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	3	2	3	3	3	3	2	2	2
CO3	2	3	3	3	3	2	3	3	3	2
CO4	3	3	2	3	2	3	2	2	2	2
CO5	2	3	1	2	3	3	3	3	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Forensic Science: Functions of forensic science - historical aspects of forensic science - definitions - concepts in forensic science - scope of forensic science - need of forensic science - basic principles of forensic science - branches of forensic science - forensic science in international perspectives.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
II	Chemistry of Forensic Investigations: Definition of physical evidence - classification of physical evidence - types of physical evidences - glass - soil - physical properties - comparing glass fragments - collection - preservation of glass evidence - forensic characteristics of soil - collection - preservation of soil evidence - fingerprints - fundamental principles of fingerprints - classification of fingerprints methods of detecting fingerprints - preservation of developed prints - document - voice examination - collection of handwriting exemplars - typescript comparisons - inks and papers - alterations - erasures - obliterations.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4, K5
III	Technological Methods in Forensic Science: Chromatographic methods - fundamental - principles - forensic applications of thin layer chromatography - gas chromatography - liquid chromatography - spectroscopic methods - fundamental principles - forensic applications of ultraviolet - visible spectroscopy - infrared spectroscopy - atomic absorption spectroscopy - atomic emission spectroscopy - mass	18	CO 1, CO 2, CO 3 CO 4, CO 5	K1,K2,K3, K4,K5

	spectroscopy - X-ray spectrometry - colorimetric analysis - Lambert-Beer law.			
IV	Forgery and Counterfeiting: Detecting forgery in bank cheques / drafts - educational records (mark lists, certificates) using UV-light - alloy analysis using AAS to detect counterfeit coins - checking silverline water mark in currency notes - jewellery - detection of gold - purity in 22 carat ornaments - detecting gold plated jewels - authenticity of diamonds - natural - synthetic - glassy.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
V	Explosive and Explosion: Introduction - classification of explosives - primary - secondary or high explosive - detonator pyro technique propellant IEDs - firing mechanism of IEDs - evaluation - assessment of explosion.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
VI	Self-Study for Enrichment: (Not to be included for External Examination) Role of Forensic scientist in Post blast investigation - collection of samples - explosion effects - technical report frame work.	-	CO 1, CO 2, CO 3 CO4	K1,K2,K3, K4

Text Books

1. Eckert G. William, (1996), Introduction to forensic sciences, New york, washington, CRC, Press.
2. Kemp, W. (1991) Organic Spectroscopy, 3rd Edition, Macmillan, Hampshire.
3. Henry, C. (2006) Physical Evidence in Forensic Science.
4. Nanda, B.B. and Tewari, R.K. (2001) Forensic Science in India: A vision for the twenty first century Select Publisher, New Delhi.

Reference Books

1. Tiwari, R. K., & Nanda, B. K. (2014) Forensic Science in India: A vision for the 21st Century.
2. Nordby, J. J., & James, S. H. (2019). An Introduction to Scientific and Investigative Techniques
3. James, S. H., & Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press.

Web References

1. [https://ga01000549.schoolwires.net/cms/lib/GA01000549/Centricity/Domain/463/Fo
rensics%20Chap%2010%20Forgery.pdf](https://ga01000549.schoolwires.net/cms/lib/GA01000549/Centricity/Domain/463/Fo%20rensics%20Chap%2010%20Forgery.pdf)
2. <http://dfs.nic.in/pdfs/EXPLOsive.pdf>
3. <https://www.azolifesciences.com/article/Chromatography-in-Forensic-Science.aspx>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

- Dr. R. Subha

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
23PCH2DSE2C	ANALYTICAL CHEMISTRY	DISCIPLINE ELECTIVE COURSE	6	3

Course Objectives

- To acquire the knowledge of basic principles and theory behind analytical techniques.
- To know the separation of chemical compounds from mixtures.
- To gain knowledge about the application of analytical techniques to analysis chemical compounds.

Prerequisites

Adsorption, elution, solubility, electromagnetic radiation.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Describe the basic concepts of data analysis, chromatography, electroanalytical methods, thermal methods and flame photometry.	K1
CO2	Understand the theory of various analytical techniques.	K2
CO3	Illustrates the instrumentation, experimental and purification details of analytical techniques.	K3
CO4	Compare various analytical techniques based on their principle and applications.	K4
CO5	Evaluate the applications of data analysis, chromatography, electroanalytical methods, thermal methods and flame photometry.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	3	3	3	3	2	3
CO2	3	3	2	3	3	3	3	3	2	3
CO3	3	3	2	3	3	3	3	3	2	2
CO4	3	3	2	2	3	3	3	2	2	2
CO5	3	3	2	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction To Analytical Chemistry: Analytical chemistry - role of analytical chemistry - classification - advantages - limitations of analytical methods - safety in laboratory - errors - types - definitions of relative error - absolute error - significant figures - mean - median - standard deviation - sensitivity - detection limits – precision - accuracy - confidence limit - test of significance - Q - test, F - test - T - test - minimization of errors.	18	CO1, CO2, CO3, CO4, CO4	K1, K2, K3, K4, K5
II	Chromatography I: Chromatography - introduction - definition - types - principles - theories - experimental details - advantages - limitations - applications of paper chromatography - thin layer chromatography - liquid - liquid partition chromatography - column chromatography.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Chromatography II: Introduction, principle, instrumentation, advantages, limitations and applications of gas chromatography, gel permeation chromatography, silver impregnated ion exchange chromatography. Principle, instrumentation and applications of high performance liquid chromatography, gas chromatography - mass spectroscopy.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Purification techniques: Purification of solid organic compounds - recrystallization - use of miscible solvents - use of drying agents - properties - sublimation - experimental techniques of distillation - fractional distillation - distillation under reduced pressure –	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	extraction - use of immiscible solvents - solvent extraction - chemical methods of purification.			
V	Thermal Methods and Flame Photometry: Thermogravimetry - Introduction - principle - instrumentation - derivative thermogravimetry analysis - factors affecting TGA - applications of TGA for quantitative analysis of calcium carbonate - copper sulphate pentahydrate - calcium oxalate hydrate - differential thermal analysis - Introduction - principle of working - factors affecting DTA - applications - flame photometry - introduction - principles - instrumentation - advantages - limitations - applications.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Methods of expressing accuracy and precision - fractional distillation - column chromatography - chemical methods of purification - gas chromatography - applications of TGA.	-	CO1, CO2, CO3	K1, K2, K3

Text Books

1. Skoog. D. A., West. D. M., & Holler. H. J. (1992). Fundamentals of Analytical Chemistry.
2. Chatwal, G. R., & Anand. S. (1999). Instrumental Method of Analysis. Himalya Publishing House, 13th reprint.
3. Srivastava. A. K., & Jain, P. C. Instrumental Approach to Chemical Analysis.
4. Allen J. Bard & Larry R. Faulkner. Electrochemical Methods: Fundamentals and Applications.

Reference Books

1. Skoog, D. A., Holler, F. J., & Crouch, R. (2006). Principles of Instrumental analysis. 6th Edition.
2. Vogel's. Textbook of Quantitative Chemical Analysis, Pearson Education. 6th Edition.

3. Kaur, H. Instrumental Methods of Chemical Analysis. Pragati Edition.

Web References

1. <https://www.simplilearn.com/data-analysis-methods-process-types-article>
2. <https://www.britannica.com/science/chromatography>
3. https://acikders.ankara.edu.tr/pluginfile.php/75185/mod_resource/content/0/Distillation.pdf
4. <https://www.med.upenn.edu/robertsonlab/assets/user-content/documents/types-of-chromatography.pdf>
5. <https://soe.unipune.ac.in/studymaterial/ashwiniWadegaonkarSelf/621%20Unit%202.pdf>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

1. Dr. G. Sivasankari
2. Dr. S. Devi

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC
ISO9001:2015Certified
TIRUCHIRAPPALLI

PG & RESEARCH DEPARTMENT OF CHEMISTRY



M.Sc., Chemistry Syllabus
2022-2023 and Onwards

**CAUVERYCOLLEGEFOR WOMEN (AUTONOMOUS)
PGDEPARTMENTOF CHEMISTRY**

VISION

- To progress into a centre of superiority in Chemistry that will blend state-of-the-art practices in professional teaching in a communally enriching way, with the holistic progress of the students as its prime emphasis.

MISSION

- To produce graduates committed to integrity, professionalism and lifelong learning by widening their knowledge horizons in range and depth.
- To awaken the young minds and discover talents to achieve personal academic potential by creating an environment that promotes frequent interactions, independent thought, innovations, modern technologies and increased opportunities.
- To enhance the quality through basic and applied research frameworks, and encourage the students to take part in entrance and competitive examinations for higher studies and career.
- To enhance services to the community and build partnerships with the industry.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc., Mathematics, M.Sc., Physics,

M.Sc., Chemistry PROGRAMMES

PO No.	Programme Outcome On completion of M.Sc., Programme, the students will be able to
PO1	Problem analysis: Provide opportunities to develop innovative design skills, including the ability to formulate problems, to think creatively, to synthesize information, and to communicate effectively.
PO2	Scientific skills: Create and apply advanced techniques and tools to solve the societal environmental issues.
PO3	Environment and Sustainability: Ascertain eco-friendly approach for sustainable development and inculcate scientific temper in the society.
PO4	Ethics: Imbibe ethical and social values aiming towards holistic development of learners.
PO5	Life long learning: Instill critical thinking, communicative knowledge which potentially leads to higher rate of employment and also for higher educational studies.

PROGRAMME SPECIFIC OUTCOMES FOR M.Sc.
CHEMISTRY

PSO NO.	Programme Specific Outcomes` Students of M.Sc., Chemistry will be able to	POs Addressed
PSO1	Acquire knowledge in basic concepts, fundamental principles, and applications of chemical and scientific theories and their relevancies in the day-to-day life.	PO1 PO2
PSO2	Design experiments, analyze, synthesize and interpret data to provide solutions to different industrial problems by working in the pure, inter and multi-disciplinary areas of chemical sciences.	PO1 PO2 PO3
PSO3	Attain maneuver in diverse contexts with Global Perspective	PO3 PO4
PSO4	Gain a thorough Knowledge in the subject to be able to work in projects at different research as well as academic institutions.	PO1 PO2 PO5
PSO5	Afford Global level research opportunities to pursue Ph.D programme targeted approach of CSIR – NET examination	PO1 PO2 PO3 PO4 PO5



Cauvery College for Women (Autonomous), Trichy-18
PG and Research Department of Chemistry

M.Sc., Chemistry

(For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
IV	Core Course–VI (CC)	Physical Methods in Chemistry - II	22PCH4CC6	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. Chemistry of Nanoscience	22PCH4CCC3A	6	4	3	25	75	100
		B. Biofuels	22PCH4CCC3B						
		C. Bioinorganic Chemistry	22PCH4CCC3C						
	Core Practical - VI (CP)	Physical Chemistry - II (P)	22PCH4CC6P	6	5	6	40	60	100
	Generic Elective Course-II (GEC)	Corrosion and Pollution Management	22PCH4GEC2	3	2	3	25	75	100
	Project	Project Work	22PCH4PW	9	5	-	-	100	100
Total				30	21				500

Courses & Credits for PG Science Programmes

S. No	Courses	No. of Courses	No. of Credits	Marks
1.	Core Course – (CC)	6	30	600
2.	Core Choice Course– (CCC)	3	12	300
3.	Core Practical - (CP)	6	30	600
4.	Discipline Specific Elective- (DSE)	3	09	300
5.	Generic Elective Course - (GEC)	2	04	200
6.	Project	1	05	100
7.	Internship	1	02	100
	Total	22	92	2200

The internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

Separate passing minimum is prescribed for Internal and External

For Theory:

- a) The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 75 marks (i.e.30 marks)
- c) The passing minimum not less than 50% in the aggregate.

For Practical:

- a) The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e.24 marks)
- c) The passing minimum not less than 50% in the aggregate.

For Project:

Marks for Dissertation : 80

Marks for Viva Voce : 20

Total marks : 100

Internal Component (Theory)

Component	Marks
Library	05
Assignment & Seminar	10
CIA -I	05
CIA-II	05
Total	25

Internal Component (Practical)

Component	Marks
Observation	05
Record	10
Continual performance	10
Model	15
Total	40

Question Paper Pattern**PART A (10X2=20)**

Answer all the questions

PART B (5X5=25)

Answer all the questions

PART C (3X10=30)

Answer any three questions

Semester IV	Internal Marks: 25		External Marks: 75	
COURSECODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22PCH4CC6	PHYSICAL METHODS IN CHEMISTRY -II	CORE	6	5

Course Objective

- To understand electronic spectroscopy of metal complexes
- To study in detail IR, Raman and NMR of inorganic compounds
- To learn the Mossbauer and magnetic properties of metal complexes

Prerequisites

Metal complexes, magnetic properties, electromagnetic spectrum.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Explain the principles of electronic, IR, NMR, ESR and mass spectrometry.	K1
CO2	Describe the applications of various spectroscopy to study the inorganic molecules.	K2
CO3	Sketch the different types of spectrum for metal complexes.	K3
CO4	Analyze the spectrum qualitatively certain chemical compounds.	K4
CO5	Assess the structure of a compound by various spectral data.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	2	3	3
CO5	3	3	2	2	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Electronic Spectroscopy Electronic configuration - terms and microstates of atoms and ions - term symbols (pn and dn) - spectroscopic terms - L-S coupling and jj coupling– effect of inter-electronic repulsion and spin- orbit coupling - selection rules - Orgel diagram - prediction and assignment of transitions for weak field $d^1 - d^9$ ions - calculation of β and $10 Dq$ for simple octahedral complexes of Co and Ni- charge transfer spectra – electronic spectra of $[Ru(bipy)_3]^{2+}$	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	IR and Raman Spectroscopy Introduction to IR spectroscopy– IR active and IR inactive vibrations - compare the intensity of M-O, M-N, M-X, and M-S stretching vibrations– factors affecting metal-ligand vibrations - Raman spectroscopy– theory of Raman effect– applications of Raman spectroscopy for inorganic chemistry - combined uses of IR and Raman Spectroscopy in the structural elucidation of simple molecules like H ₂ O, ClF ₃ , NO ₃ -and ClO ₃ - - applications of IR to identify terminal and bridging carbonyl group.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	NMR Spectroscopy Introduction to NMR spectroscopy – one dimensional NMR of ¹³ C, ¹⁵ N, ³¹ P, ¹⁹ F – structural determination of molecules by 2D NMR (Peptides-I & II) – chemical exchange – hydrogen or deuterium exchange - Diffusion ordered spectroscopy (DOSY)– use of chemical shift reagents – NMR of paramagnetic compounds (contact & pseudo-contact shift) - magnetic resonance imaging (MRI).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

IV	EPR Spectroscopy and Magnetic properties Electron spin and its characteristics - treatment of EPR of hydrogen atom with spin levels, g-value and hyperfine interaction in hydrogen atom and free radicals - McConnell equation - spectra of V(II), Mn(II), Fe(II), Co(II), Ni(II) and Cu(II) complexes - applications of EPR to biological molecules containing Cu(II) and Fe(III) ions - magnetic properties - types of magnetism -magnetic properties of free ions - magnetic moments and their applications to the elucidation of structures of inorganic compounds - magnetic properties of lanthanides and actinides.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	NRF and Mass spectrometry Basic principle of NRF spectroscopy - Mossbauer experiment - isomer shift - quadrupole splitting magnetic interactions - applications to iron and tin compounds - mass spectrometry - introduction - ion production -EI and CI - factors affecting fragmentation - ion analysis - ion abundance - mass spectral fragmentation of organic compounds - common functional groups - molecular ion peak - metastable peak - McLafferty rearrangement.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Applications of electronic spectroscopy to metal complexes - symmetry notation for molecular vibrations - Examples for different spin systems - chemical shifts and coupling constants - factors affecting the magnitude of g and A tensors in metal species – high resolution mass spectrometry.	-	CO1	K1, K2

Text Books

1. Drago, R.S. (2012). Physical Methods in Inorganic Chemistry. Affiliated East-West Press Pvt. Ltd., New Delhi.
2. Drago, R.S. (1992). Physical Methods in Chemistry. Saunders College Publications, Philadelphia.
3. Cotton, F.A. & Wilkinson, G. (1999). Advanced Inorganic Chemistry. 6th Ed., Wiley Eastern Company, New Delhi.

4. Wheatley, P. J. (1981). The Determination of Molecular Structure. 2nd Ed., Dover Publications, Mineola.
5. Leigh, G. J. & Winterton, N. (2002). Modern Coordination Chemistry. Royal Society of Chemistry, UK.

Reference Books

1. Ebsworth, E. A. V. (1987). Structural Methods in Inorganic Chemistry. 3rd Ed., ELBS, Great Britain.
2. Kemp, W. (2011). Organic Spectroscopy. 3rd Ed., Palgrave, New York.
3. Puri, Sharma & Pathania, (2024). Principles of Physical Chemistry; 48th Ed., Vishal Publishing Co., Jalandhar.
4. Wahid.U.Malik, Tuli, G.D. & Madan, R.D. (2009). Selected Topics in Inorganic Chemistry. 7th edition, S.Chand, New Delhi.
5. Abdul Jameel, A. (2003). Application of Physical Methods to Inorganic compounds. JAN publication, Trichy.

Web References

1. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/chemistry/07.inorganic_chemistry-ii/12._electronic_spectra_of_coordination_complexes-iv/et/7436_et_et.pdf
2. https://oms.bdu.ac.in/ec/admin/contents/160_P16CH41_2020052904251921.pdf
3. <https://www.youtube.com/watch?v=4yUQMEwW4TU>
4. <https://ccsuniversity.ac.in/bridge-library/pdf/chem-ESR-Lecture-5.pdf>
5. https://www.blogs.uni-mainz.de/fb09akguetlich/files/2017/11/Moessbauer_Lectures.pdf

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

Dr. P. Thamizhini

Semester IV	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22PCH4CCC3A	CHEMISTRY OF NANOSCIENCE	CORE CHOICE	6	4

Course Objectives

- To know the basic concepts of nanoscience and synthetic methods of various nanoparticles.
- To know the ideas of nano clusters, reactions as semiconductors and its social applications like agriculture and food technology.

Prerequisites

Synthesis, characterization, solar cells, nano structures.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Thorough knowledge of the general principles of physics, chemistry, electronics and biology that play a role on the nanometer scale	K1
CO2	Insight into the materials, fabrication and other experimental techniques that can be used on the nanoscale, as well as their limitations	K2
CO3	In-depth knowledge of at least one specialisation area within the field of nanoscience and nanotechnology	K3
CO4	Sufficient scientific background to undertake research.	K4
CO5	Proficiency in translating this knowledge into useful technological applications	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	3	2	3	3	3	3	2	2	2
CO3	2	3	3	3	3	2	3	3	3	2
CO4	3	3	2	3	2	3	2	2	2	2
CO5	2	3	1	2	3	3	3	3	2	3

“1”–Slight (Low)Correlation

“2”–Moderate (Medium)

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Synthetic Methods: Nano dimensional materials – synthesis – hydrothermal synthesis- solvo thermal synthesis – microwave irradiation– sol-gel - precipitation technologies – chemical vapour condensation process – sonochemical synthesis – Microbial and plant-mediated synthesis.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Characterization of Nanoscale Materials: Principles of Atomic Force Microscopy (AFM) – Transmission Electron Microscopy (TEM) Resolution and Scanning Transmission Electron Microscopy (STEM) – Scanning Tunneling Microscopy (STM) – Scanning Nearfield Optical Microscopy (SNOM) and Scanning ion conductance microscope.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Carbon Clusters and Nanostructures: Nature of carbon bond– new carbon structures – carbon clusters – discovery of C ₆₀ –alkali doped C ₆₀ –superconductivity in C ₆₀ –larger - smaller fullerenes - carbon nanotubes – synthesis – single walled carbon nanotubes – structure and characterization – chemically modified carbon nanotubes – applications of carbon nanotubes - nanowires –synthetic strategies – applications of nanowires	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Chemical Sensors and Biosensors: Biosensor and nanobiosensor - basic concepts – characterization - Enzyme– meta NP hybrids for	18	CO1 CO2	K1 K2

	biosensing - generation of nanostructures- Biomolecule – different types of nanobiosensors - nano biosensors for medical diagnostics -nanoprobes for analytical applications.		CO3 CO4 CO5	K3 K4 K5
V	Solar and Fuel Cells: Nanomaterials for solar cells- Dye-sensitized solar cells- Organic-inorganic hybrid solar cells- Polymer composites for solar cells- current status and future prospects. Polymer membranes for fuel cells, Acid/ alkaline fuel cells- carbon nanotubes for energy storage- use of nanoscale catalysts to save energy and increase the industrial productivity.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Classification and properties of nano materials, Scanning Nearfield Optical Microscopy, applications of carbon nanotube, nano biosensors for medical diagnostics, Dye-sensitized solar cells.	-	CO1 CO2 CO3 CO4	K1 K2 K3 K4

Text Books

1. Rao, C. N. R., Muller, A. and Cheetham, A. K., (2004). The Chemistry of Nanomaterials: (Eds), Vol. 1 and 2 Wiley-VCH. Germany, Weinheim.
2. Poole, C. P., and Owens, F. J., (2003). Introduction to Nanotechnology. Wiley Interscience New Jersey.
3. Pradeep, T. (2007) Nano: The Essentials in Understanding Nanoscience and Nanotechnology. 1st Ed., Tata McGraw Hill, New York.
4. Balandin, A. A., Wang, K. L., (2006). Handbook of Semiconductor Nanostructures and Nanodevices Vol 1-5. American scientific publishers.
5. Frewer, Lynn. Willehm, Norde, J. Fischer, R. H., and Kampers, W. H., (2011). Nanotechnology in the Agri-food sector Wiley-VCH Verlag.

Reference Books

1. Klabunde, K.J., (2009). Nanoscale Materials in Chemistry; 2nd Ed., Wiley-Interscience, New York .
2. Fujita, H., (2003). Micromachines as Tools in Nanotechnology Springer-Verlag. Berlin.
3. Kain, W., & Schweder ski, B. (2013). Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life; 2nd Ed., John-Wiley R Sons, New York.
4. Chaudry,Q., Castle, L., and Watkins, R., (2010) Nanotechnologies in Food. RSC Publications.

Web References

1. https://www.sathyabama.ac.in/sites/default/files/course-material/2020-10/note_1519281517.pdf
2. <https://www.britannica.com/technology/solar-cell>
3. <https://www.nano.gov/about-nanotechnology/applications-nanotechnology>
4. <https://www.iberdrola.com/innovation/nanotechnology-applications>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

1. Dr. G. Sivasankari &
2. Dr. K. Shenbagam

Semester IV	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH4CCC3B	BIOFUELS	CORE CHOICE	6	4

Course Objectives

- To understand basic concepts about biomass derived energy
- To acquire the concept of 1st generation, 2nd generation and advance biofuels
- To understand terminologies related to biomass conversion and biofuel production
- To describe techno-economic analyses of biofuel conversion technologies

Prerequisites

Biomass derived energy, advance biofuels, biofuel production, environmental impact.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Know the outline about introduction of biofuels, biorefineries and environmental impacts.	K1, K2
CO2	Stabilize the knowledge on classifications and significance of biofuels in various fields.	K3
CO3	Interpret the characteristics and production methods of different biofuels and environmental impacts.	K4
CO4	Recognize the technique for synthesis and purification of classified biofuels.	K5
CO5	Predict the scope of different biofuels in various fields.	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	3	3	2	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	1	3

“1”–Slight (Low)Correlation “2”–Moderate (Medium)Correlation

“3”–Substantial (High)Correlation “-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Biofuels: Classification of biofuels- solid-liquid - gaseous fuels- production processes - raw materials – products – Generation – first – second - third - fourth generation of biofuels Concepts of biorefinery - alternative energies - environmental - economic and regulatory issues- value added processing of biofuel residues - co-products.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Solid biofuels: Structure - properties of cellulose - isolation and applications of lignin - pretreatment/fractionation by dilute acid - steam explosion – organo solvent and ammonia fiber explosion (AFEX) methods - biochemical conversion of lignocellulosic to alcohols by separate hydrolysis and fermentation (SHF) - simultaneous saccharification and fermentation (SSF) process - thermal conversion of biomass to liquid fuels by gasification – pyrolysis	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Liquid Biofuels: Characteristics - significance of liquid biofuels - production - refined oils as fuel hydrogenation of unsaturated lipids - Fischer-Tropsch process for the production of hydrocarbons from syngas - bioethanol- raw materials - pretreatment processes- enzymatic hydrolysis and fermentation – recovery - uses – regulations - production of Ethyl ter-butyl ether (ETBE) biodiesel- trans esterification - raw materials - pretreatment process- separation – purification - quality- uses - regulations.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Gaseous Biofuels: Characteristics and scope of gaseous biofuels- Energy conversion process- anaerobic digestion acidogenesis – acetogenesis – methanogenesis - disintegration – hydrolysis - environmental and optimization conditions for production of gaseous biofuels – temperature –pH – alkalinity nutrients - organic loading	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

	rate - solid and hydraulic retention time - granulation of anaerobic biomass.			
V	Other Biofuels: Biobutanol production – Principles, materials and feedstocks – Process technologies – Biopropanol – Bioglycerol – Production of bio-oils via catalytic pyrolysis – Life-Cycle environmental impacts of biofuels and Co-products.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Generation of biofuels -Integration of biofuels into biorefineries -Environmental sustainability of biofuels – Economic sustainability of biofuels.	-	CO1 CO2	K1 K2 K3

Text Books

- 1) K. Sharma, Environmental chemistry, Krishanan publications, 2014.
- 2) Rao, M.N and Datta, A.K, Wastewater treatment, Oxford and IBH publishers, 2007.
- 3) Robert C. Brown, Biorenewable resources: Engineering new products from Agriculture, Wiley Publishers, 2003.
- 4) Mousdale, Biofuels: Biotechnology, chemistry & Sustainable development, CRC Press, 2008.

Reference Books

- 1) Mark Hammer, Water and Wastewater Technology, Pearson, 1975.
- 2) Sharma, B.K, An Introduction to Environmental pollution, Krishna Prakashan media, 2001.
- 3) Caye Drapcho, Terry Walker, Biofuels Engineering Process Technology, McGraw Hill, 2008.
- 4) Sungyu Lee & Y.T. Shah, Biofuels and Bioenergy Process Technologies, CRC Press, 2013.

Web References

1. <https://www.slideshare.net/flanzashebarina/biofuels-28535080>.
2. <https://unstats.un.org/unsd/energy/meetings/2016iwc/19renewables.ppsx>.
3. <https://www.slideshare.net/AjaySinghLodhi/biofuel-226702434>.
4. <https://www.rgpv.ac.in/PDF/05%20Biomass.ppt>.
5. <https://www.slideshare.net/tarun316/biobutanol-ppt>.

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

Dr. K. Uma Sivakami

Semester IV	Internal Marks:25		External Marks:75	
COURSECODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH4CCC3C	BIOINORGANIC CHEMISTRY	CORE CHOICE	6	4

Course Objectives

- ✓ To learn the basic concepts of bioinorganic chemistry
- ✓ To give ideas of biological membrane
- ✓ To learn the concepts of oxygen transport
- ✓ To study the role of biological enzymes

Prerequisites

Biological enzymes, Enzyme functions, metallo enzymes

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and summarize the fundamentals of bioinorganic chemistry	K1, K2
CO2	Interpret the concept to structure, function and transport of enzymes.	K3
CO3	Categorize the interaction and effect of biological enzymes	K4
CO4	Evaluate the role of metals in function of biological system	K5
CO5	Predict the favorable conditions of application of metals and enzymes in daily life.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	3	3	2	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	1	3

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	General Principles of Bioinorganic Chemistry: Occurrence and availability of Inorganic elements in biological systems- Metal ion interactions with purine and pyrimidine bases, nucleosides, nucleotides and nucleic acids - DNA and RNA, metal ions in genetic information transfer- Different possible ways of DNA interaction	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Function and Transport of Alkali and Alkaline earth metals: Uptake, transport and storage of metal ions by organisms - structure and functions of biological membranes - the generation of concentration gradients (the Na ⁺ -K ⁺ pump) - mechanisms of ion-transport across cell membranes – bleomycin - siderophores (e.g. enterobactin and desferrioxamine) - transport of iron by transferring - storage of iron by ferritin - bio chemistry of calcium as hormonal messenger.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Metalloporphyrins/Metalloenzymes: Dioxygen transport and storage - hemoglobin and myoglobin: electronic and spatial structures - hemeythrin and hemocyanine - synthetic oxygen carriers, model systems - blue copper proteins (Cu) - iron-sulfur proteins (Fe)- cytochromes electron transport chain - carbon monoxide poisoning	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Redox enzymes: Catalase, peroxidase, super oxide dismutase (SOD), cytochrome P-450, nitric oxide synthases (NOS), ascorbate oxidase, aldehyde oxidase - molybdo enzymes- xanthene oxidase, nitrate reductase, sulfite oxidase including some model study.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

V	Bioenergetics DNA polymerization, glucose storage, metal complexes in transmission of energy- chlorophylls, photo system I and photo system II in cleavage of water - Model systems.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-Study for Enrichment: (Not to be included for External Examination) Medicinal bioinorganic chemistry: platinum complexes in cancer therapy – cis-platin and its mode of action – metal toxicity. Metals in medicine: anticancer agents, diabetes, arthritis, radionuclides and related applications		CO1, CO2 CO3	K1, K2, K3, K4

Text Book

1. Lippard, S. J., and Berg, J. M., Principles of Bioinorganic Chemistry, (1997) Panima Publishing Company, New Delhi
2. Kaim W., and Schewederski, B., Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life (2013 John Wiley & Sons, New York, USA,
3. Bertini, I., Gray, H. B., Lippard, S. J. and Valentine, J. S., Bioinorganic Chemistry, 1st South Asia edition, (2007) Viva books Pvt. Ltd
4. Huheey, J. E., Keiter, E. A. and Keiter, R. L., and Medhi, O. K., Inorganic Chemistry Principles of Structure and Reactivity, 4th edition (2006), Pearson Education,
5. Behrens, P., Bauerlein, E., Hand Book of Biomineralization, 1st edition, Vol. 1& 2 Wiley-VCH.
6. Arnikar, H. J., Essentials of Nuclear Chemistry, 4th edition (1995), New Age International Publishers Ltd., New Delhi,
7. Loveland, W. D., Morrissey, D. J., Seaborg, G. T., Modern Nuclear Chemistry (2006), Wiley-VCH Verlag GmbH Co. KGaA
8. Glasstone, 'Source Book on Atomic Energy', 3rd edition (1979), Affiliated East West Press.
9. Lee, J. D. Concise Inorganic Chemistry, 5th edition (1996) Blackwell Science.
10. S. J. Lippard and J. M. Berg, Principles of Bioinorganic Chemistry (1994), University Science Books, Mill Valley, California.

Reference Books

1. Purcell, K. F. and Kotz, J. C., Inorganic Chemistry, (2012) Cengage Learning.
2. Cotton, F. A., Wilkinson, G., Carlos A. Murillo, Manfred Bochmann, Advanced Inorganic Chemistry, 6th edition (2007) A Wiley - Interscience Publication, John –Wiley & Sons, USA.
3. Atkins, P., Overton, T., Rourke, J., Weller M., and Armstrong, F., Inorganic Chemistry, 5th edition (2010) Oxford University Press.
4. Lehninger, A., Nelson, D. L., Cox, M. M, Principles of Biochemistry, 5th edition (2008) W.H Freeman.
5. Alessio, E., Bioinorganic Medicinal Chemistry, 1st Edition (2012) Wiley-VCH Verlag GmbH Co. KGaA.

Web References

1. <https://www.youtube.com/watch?v=jrkqvZSCsQU>
2. <https://www.sciencedirect.com/science/article/pii/S2772422022000283>
3. <https://www.slideshare.net/fatimasaleh94214/enzymes-2-30256325>
4. <https://www.slideshare.net/iqbal1313/bioenergetics-25078367>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designers

Dr. K. Shenbagam, Assistant Professor of Chemistry

Semester IV	Internal Marks 40	External Marks:60		
COURSECODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDIT S
22PCH4CC6P	PHYSICAL CHEMISTRY- II (P)	CORE	6	5

Course Objectives

- To interpret the electrical devices standardization
- This course helps to perform various electrical experiments.
- To know the difference between conductometric and potentiometric titration.
- To analyze the pH meter and to identify common items as acid, base or neutral.

Course Outcome

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the various types of reactions using instruments	K2
CO2	Apply the methods and identify the suitability of methods	K3
CO3	Analyze the electrical data and correlating results graphically	K3
CO4	Estimate the concentration of ions using Potentiometer	K4
CO5	Estimate the concentration of ions using Conductometer	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	2	1	3	2	1
CO2	2	3	2	2	2	3	2	1	3	2
CO3	2	3	2	2	2	1	1	1	2	2
CO3	2	3	2	2	2	2	1	2	2	1
CO3	2	3	2	2	2	1	1	1	2	2

“1”–Slight (Low)Correlation

“2”–Moderate (Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

Any ten experiments (to be decided by the course teacher) out of the following experiments.

A) Conductometry

- 1) Acid-alkali titrations.
- 2) Precipitation titration
- 3) Displacement titrations.
- 4) Determination of dissociation constant of weak acids
- 5) Solubility product of sparingly soluble salts like Barium chromate and Lead sulphate.
- 6) Verification of Onsager equation for a strong electrolyte like NaCl and KCl.
- 7) Determination of relative strength of two acids.
- 8) Determination of degree of hydrolysis and hydrolysis constant of a substance.

B) Potentiometry

- 1) Acid- alkali titrations.
- 2) Precipitation titrations.
- 3) Redox titrations.
- 4) Determination of dissociation constant of weak acids
- 5) Determination of solubility product of silver salts.
- 6) Determination of activity and activity coefficient of ions.

C) pH-Metry

- 1) Titration of ortho-phosphoric acid.
- 2) To determine the pH of a buffer solution using a quinhydrone electrode-Henderson's equation.

Text Books

1. Yadav J. B, Advanced Practical Physical Chemistry, 20th Edition (2001), GOEL Publishing House
2. Levitt B. P., Findlay's Practical Physical Chemistry; 9th Edition, 1985, Longman.
3. Gurtur J. N and Kapoor R, Advanced Experimental Physical Chemistry, S. Chand and Co. Vol. 1- 1997

Reference Books

1. Das R.C and Behera Experimental Physical Chemistry Tata McGraw – Hill, 1983
2. Shoemaker and Gerland , Advanced Physical Chemistry Experiments, McGraw –Hill Higher Education 2009

Web References

1. <https://www.youtube.com/watch?v=-GS6uoFf3qQ>
2. https://www.youtube.com/watch?v=j_Fk3X3YNww
3. <https://www.youtube.com/watch?v=gd1YQr-74sw>
4. <https://www.youtube.com/watch?v=JhKUeM29k94>
5. <https://www.youtube.com/watch?v=YWBZuOgvPWE>

Pedagogy

Chalk and talk, PPT, Discussion, Demo, Quiz, Seminar

Course Designers

Dr. K Shenbagam

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCH4GEC2	CORROSION AND POLLUTION MANAGEMENT	GENERIC ELECTIVE COURSE	3	2

Course Objectives

- To describe the forms, mechanism, and kinetics of corrosion.
- To determine the probable corrosion, corrosion rate, and corrosion mechanism of the metallic material in the given environment.
- To recommend a suitable corrosion protection method for sustainable materials use.

Prerequisites

Corrosion, pollution, solid waste, e-waste

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the basic concept of corrosion and pollutions.	K1
CO2	Understand the types of corrosion and objectives of pollution management.	K2
CO3	Illustrate the significance of corrosion inhibition and pollution control.	K3
CO4	Analyze the methods to prevent corrosion and pollution.	K4
CO5	Propose a way to avoid corrosion and pollution.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	3	3	2	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	1	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Basic aspects of corrosion: Importance of corrosion studies - EMF and galvanic series - categorization of corrosion - dry corrosion and electrochemical corrosion - difference between chemical and electrochemical corrosion - factors influencing corrosion.	09	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Types of corrosion: Pitting, inter-granular, waterline corrosion, stress corrosion, erosion corrosion, galvanic corrosion, dezincification - atmospheric corrosion - classification, factors influencing atmospheric corrosion - microbiological corrosion - soil corrosion.	09	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Effective Coatings: Introduction - classification - metallic coating, non - metallic coating - organic coatings - pre-treatment of the surface - metallic coatings - hot dipping, spraying, cladding inorganic non-metallic coating - chromate coating, phosphate coating and oxide coating - organic coatings – paints - requirements of good paint.	09	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Control Measures of air and soil pollution: Control of particulate emissions - gravitational settling chambers - cyclone separators - fabric filters - electrostatic precipitators - wet scrubbers - control of gaseous pollutants - control of nitrogen oxides pollution - control of SO _x pollution - control measures to prevent soil pollution - integrated plant nutrient management	09	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	- integrated pest management - bioremediation - phytoremediation.			
V	Solid and e-waste management: Objectives of solid waste management - municipal solid waste treatment - dumping - composting - vermi composting - sanitary land fill - incineration of municipal solid waste - industrial solid waste treatment - recycling techniques - e-waste - composition - recovery of metals and recycling.	09	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment: (Not to be included for External Examination) Forms of metallic corrosion, corrosion failure analysis, corrosion testing and monitoring - control of pollutant emission from mobile sources - biodegradability of organic matter, cellulosic waste and lignin - solid waste management by biotechnology.	-	CO1, CO2	K1, K2

Text Books

1. Pletcher, D., & Walsh, F. C. (1993) Industrial Electrochemistry, Vol. II, Blakrid Academic Professional, London.
2. Jones, D. (1992) Principles and prevention of corrosion, Macmillan Publications, New York.
3. Meketta, J. J. (1993) Cathodic protection Theory and practice, Marcel Dekker Publication, New York.
4. Kaur, H. (2016). Environmental Chemistry, A Pragati Prakashan – Meerut Publication.

Reference Books

1. Schweitzer, P. A. (2009). Fundamentals of Corrosion, CRC Press, 1st Edition.
2. R. Winston Revie, R., & Uhlig, H. H. (2008). Corrosion and Corrosion Control: An Introduction to Corrosion Science and Engineering, Wiley, 4th Edition.
3. Washington, D. C. (2011). Research Opportunities in Corrosion Science and Engineering, National Academic Press.

4. De, A. K. (2018). Environmental Chemistry. 9th Edition, New Age International Publishers, New Delhi.

Web References

1. https://www.slideshare.net/rayhan_u01/corrosion-engineering-54230652.
2. https://www.usna.edu/NAOE/files/documents/Courses/EN380/Course_Notes/Ch05_Corrosion_Types.pdf.
3. <https://www.slideshare.net/Faisal419/coating-chemistry>.
4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2963874/>
5. https://ec.europa.eu/echo/files/evaluation/watsan2005/annex_files/WEDC/es/ES07CD.pdf
6. <https://cpcb.nic.in/displaypdf.php?id=em9iZW5nYWx1cnUvQVBDRHMucGRm>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

1. Dr. K. Uma Sivakami
2. Dr. S. Devi

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UPH4AC6	CHEMISTRY - II	ALLIED	4	3

Course Objectives

- To stimulate the concepts in basic chemistry and apply them in real world problems.
- To understand the preparation and properties of carbohydrates, amino acids and proteins.
- To study the basic concept of polymers, photochemistry, electrochemistry and magnetic properties.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Recall the fundamental ideas in material science and biomolecules.	K1
CO2	Understand the characteristics of polymers, biomolecules, alloys, photochemical and electrochemical reactions	K2
CO3	Identify the types of polymerization, biomolecules, photolytic process, magnetic and nanomaterials	K3
CO4	Calculate the molecular weight, quantum yield and emf of a cell.	K3
CO5	Analyze the applications of industrial and bio materials	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	2	3	2	3
CO2	3	3	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	2
CO4	3	3	3	3	3	3	3	2	3	2
CO5	3	3	2	3	3	3	2	3	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” Indicates there is No Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Carbohydrates, Aminoacids and Proteins: Carbohydrates - classification - glucose and fructose - preparation and properties - structure of glucose only - Fischer and Haworth cyclic structures - amino acids and proteins - classification based on structure - essential and non - essentials amino acids - preparation – properties – uses - proteins - classification based on physical properties and biological functions - structure of proteins - primary and secondary structure.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Photochemistry: Introduction - Photosynthesis - comparison between thermal and photochemical reactions - laws of photochemistry - Beer-Lambert law - Grotthus-Dropper law - Einstein's law of photochemical equivalence - quantum yield - actinometer - kinetics of hydrogen-chlorine reaction - Jablonski diagram - photoprocesses - phosphorescence - fluorescence - photosensitization - quenching - types of luminescence - thermoluminescence - bio-luminescence - chemiluminescence.	12	CO1, CO2, CO3, CO5	K1, K2, K3, K4
III	Electrochemistry and Magnetic Properties of Materials: Galvanic cells - emf - standard electrode potential - reference electrodes - electrochemical series and its applications - corrosion - types - methods of prevention –galvanization - electroplating - cathodic protection - magnetic properties of molecules - types of magnetic behavior- dia - para - ferro - antiferro magnetism	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	- magnetic susceptibility - determination of magnetic moment using Guoy balance - applications of magnetic measurements.			
IV	Material Science: Ferrous and non-ferrous alloys - aluminium - copper - titanium - nickel alloys - types and composition of glass - cement - ceramics - nanomaterials - nanoparticles and bulk materials - classification - synthesis - properties - applications of carbon nanotube - graphene - quantum dots - energy storage devices - supercapacitors - batteries - solar cell	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Polymer Chemistry: Introduction - functionality - nomenclature - classification of polymers - differences between thermoplastic and thermosetting polymers - types - mechanism of polymerization - addition, condensation and copolymerization - properties of polymers - transition temperature - tacticity - molecular weight - weight average and number average - polydispersity index - preparation - properties - uses of Nylon 6, 6 - epoxy resin.	12	CO1, CO2, CO3, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment: (Not to be included for External Examination) Techniques of polymerization - bulk - emulsion - solution - suspension - tertiary structure of proteins - kinetics of hydrogen - bromine reactions - fuel cells - properties of glass.	-	CO1, CO2, CO3, CO4	K1, K2, K3, K4

Text Books

1. Puri, B. R., Sharma, L. R., & Kalia, K. K. (2018). Principles of Inorganic Chemistry. 33rd edition. Shoban Lal Nagin Chand & Co., New Delhi.
2. Bahl, B. S., & Bahl, A. (2010). Advanced Organic Chemistry. (12th edition), New Delhi, Sultan Chand & Co.
3. Puri, B. R., Sharma, L. R., & Pathania, M. S. (2022). Principles of Physical Chemistry. 48th edition. Shoban Lal Nagin Chand & Co, New Delhi.
4. Arumugam, (2007). Materials Science, Anuradha Publications.
5. Gopalan, R., & Sundaram, S. (2015). Engineering Chemistry - I. 2nd edition, Sultan Chand & Sons.

Reference Books

1. Madan, R. D. (2000). Modern Inorganic Chemistry. S. Chand and Company. New Delhi.
2. Mohan, S. and Arjunan, V.(2016). Principles of Materials Science. MJP Publishers.
3. Morrison, R. T., Boyd, R. N., & Bhattacharjee, S. K. (2011). Organic Chemistry. (7th edition), Pearson India, (2011).

Web References

1. <https://web.mit.edu/5.33/www/lec/poly.pdf>.
2. <https://byjus.com/biology/biomolecules/>.
3. <http://stpius.ac.in/crm/assets/download/Photochemistry.pdf>.
4. <https://archive.nptel.ac.in/content/storage2/courses/113108051/module1/lecture1.pdf>.
5. https://www.ccri.edu/chemistry/courses/chem_1100/terezakis/notes/Chapter_19_Lecture_Notes.pdf.
6. https://www.sathyabama.ac.in/sites/default/files/course-material/2020-10/UNIT-1_4.pdf.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

- Dr. S. Devi

Semester II	Internal Marks: 25 External Marks: 75			
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCH4GEC2	FOOD ADULTERANTS AND HEALTH CARE	GENERIC ELECTIVE COURSE-II	2	2

Course Objective

- To provide an understanding of food and nutrition
- To provide an understanding of the chemical basis of food preservation and the effects of processing and storage on food quality
- To familiarize the student with common experimental methods used in the study of the major food adulterant
- To know various types of health care, balanced diet and role of water balance in health.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Know the outline about the importance of health, sources of food, hazards of food additives and food poisoning.	K1&K2
CO2	Classify and identify common adulterants in different foods, food poisoning and impacts on health.	K3
CO3	Understand the common Food additives in food products, its prevention laws and importance of water balance in health care.	K4
CO4	Recognize the significance of nutrients, balanced diet and types of health care.	K5
CO5	Predict the nutrient, functions, sources of non-adulterants food and water for health care.	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	1	3	2
CO2	3	2	1	2	2	3	3	1	1	2
CO3	3	2	2	3	3	3	3	2	2	3
CO4	3	1	2	3	2	3	3	2	1	2
CO5	3	1	2	3	2	3	3	2	1	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Food and food poisoning: Sources of food - types - advantages and disadvantages - constituents of food - carbohydrate - protein -fats and oils - vitamins and minerals - natural toxicants - food Poisoning: sources - causes and remedy - causes and remedies for acidity-gastritis- indigestion and constipation.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6
II	Food adulterants: Adulterants- common adulterants in different foods - milk and dairy products - vegetable oils – fats - spices – condiments - cereals pulses - sweetening agents and beverages- contamination with toxic chemicals - pesticides and insecticides - Laws of prevention of food adulteration - Methods for detection of common adulterants in milk- milk products- oils and fats -sweetening agents - grains - spices - coriander powder - turmeric powder - coffee powder - tea dust and asafoetida.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6
III	Food additives: Food additives: artificial sweeteners- saccharin - cyclamate and aspartame- food flavors: esters - aldehydes and heterocyclic compounds- antioxidants: permitted - non-permitted food colors- stabilizers - thickeners and emulsifiers -other functional additives- soft drinks- formulation health drinks-preservatives- baking powder - yeast.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6

IV	Health: Definition of Health- WHO standard - balanced diet- Primary health care - secondary and tertiary health care- Primitive health care: preventive - curative - rehabilitative health care - spiritual health care- concepts of social medicine -preventive medicine and community medicine.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6
V	Water Balance in health: As a nutrient- functions- sources- requirements- distribution of water in the body- exchange of water in the body- composition of body fluids- water exchange between plasma and interstitial fluid-Water imbalance – dehydration- water intoxication.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6
VI	Self-Study for Enrichment (Not to be included for External Examination) Preservation of food by use of chemicals-Preservation by use of sugar-pickling-principles of Food Preservation- diet for children and adults-role of water in health.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6

Text Books:

1. Seema Yadav, Food Chemistry, Anmol publishing (P) Ltd., New Delhi, 2006.
2. Alex Ramani, Food Chemistry, MJP publishers, Chennai., 2009.
3. Jayashree Ghosh, Text book of Pharmaceutical Chemistry S. Chand & Co. Publishers, New Delhi, 2003.
4. S. Lakshmi, Pharmaceutical Chemistry, S. Chand& Sons, New Delhi,2004.

Reference Books:

1. Thomas M. Devlin, Textbook of Biochemistry with Clinical Correlations, John Wiley & Sons; 7th edition, 2010.
2. Ashutosh Kar, Medicinal Chemistry, New Age International, 2007.
3. Joshi A.S., Nutrition & Dietetics, Tata Mcgraw hill, New Delhi, 1998.

Web Reference

<https://www.slideshare.net/HiwrHastear/food-poisoning-60301801>.

<https://www.slideshare.net/swatishikha10/food-adulteration-96507428>.

<https://www.slideshare.net/bhambieannmalacas/food-additives-ppt>.

<https://www.slideshare.net/sivanandareddy52/definition-concept-of-health>.

<https://www.slideshare.net/rajud521/balance-water>.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

Dr. K. Uma Sivakami.

ANNEXURE J

CAUVERY COLLEGE FOR WOMEN(AUTONOMOUS)

Nationally Accredited with 'A' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE



B.Sc. COMPUTER SCIENCE

SYLLABUS

2023-2024 and Onwards



Cauvery College for Women(Autonomous), Trichy

PG & Research Department of Computer Science

B.Sc. Computer Science

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK(CBCS – LOCF)

(For the Candidates admitted from the Academic year 2023-2024 and onwards)

Semester II

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
II	I	Language Course-II(LC)	பொதுத்தமிழ்-II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar - II	22ULH2						
			Prose, Grammar and History of Sanskrit Literature	23ULS2						
			Basic French - II	22ULF2						
	II	English Language Course – II(ELC)	General English- II	23UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Programming in Java	22UCS2CC2	5	5	3	25	75	100
		Core Practical - II (CP)	Java Programming (P)	22UCS2CC2P	3	3	3	40	60	100
		Core Practical -III (CP)	Data Visualization (P)	23UCS2CC3P	2	2	3	40	60	100
		First Allied Course – III (AC)	Operations Research	22UCS2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Ability Enhancement Compulsory Course-III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
	Extra Credit Course		SWAYAM		As per UGC Recommendation					
	Total					30	22			

Semester II	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
23UCS2CC3P	DATA VISUALIZATION (P)	CORE	2	2

Course Objective

- To perform basic calculations and formatting on Data
- To expose the visual representation methods and techniques that increase the understanding of complex data
- To gain knowledge in good design practices for visualization of data

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Demonstrate the use of basic Functions, Methods and Formatting	K2
CO2	Identify the different Models for data analysis	K3
CO3	Analyze the data using Graph Function	K4
CO4	Construct the data analysis report with proper validation	K5
CO5	Build Dashboard for data visualization	K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	2	3	2	3	1	3	3
CO2	3	3	3	3	3	3	3	2	3	3
CO3	3	3	3	2	3	2	3	1	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight(Low) Correlation

“3”–Substantial (High) Correlation

“2”–Moderate(Medium)Correlation

“-”indicates there is no Correlation.

List of Exercises:

1. Using Microsoft Excel
 - a. Creation and Formatting
 - b. Functions and Formulas
 - c. Graphs
 - d. Lookup and Reference Functions
 - e. Data Validation
 - f. Pivot table
 - g. Data analysis report generation
 - h. Working with multiple worksheets
2. Using Power BI
 - a. Basic Reports
 - b. Filtering Data
 - c. Charts
 - d. Book marks
 - e. Dashboard Creation
 - f. Data Visualization

Web References:

1. https://www.tutorialspoint.com/excel_data_analysis/index.htm
2. <https://www.udemy.com/course/data-visualization-in-excel-for-business-professionals/>
3. <https://www.w3schools.com/googlesheets/>
4. <https://www.smartsheet.com/how-create-dashboard-excel>

Pedagogy:

Demo by e-Contents

Course Designer:

Ms.N.Agalya

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified TIRUCHIRAPPALLI

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE



B.Sc. COMPUTER SCIENCE

SYLLABUS

2022 -2023 and Onwards



Cauvery College for Women (Autonomous), Trichy

PG & Research Department of Computer Science

B.Sc. Computer Science

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester IV

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total	
							Hrs.	Marks			
								Int	Ext		
IV	I	Language Course - IV (LC)	Pandaiya Ilakkiyamum, Urainadaiyum	22ULT4	6	3	3	25	75	100	
			Hindi Literature & Functional Hindi	22ULH4							
			Drama, History of Drama Literature	22ULS4							
			Intermediate French - II	22ULF4							
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature- II	22UE4	6	3	3	25	75	100	
	III	Core Course – IV(CC)	Database Management Systems	22UCS4CC4	6	6	3	25	75	100	
		Core Practical - V(CP)	SQL & PL/SQL (P)	22UCS4CC5P	4	4	3	40	60	100	
		Second Allied Course- III (AC)	Microcontrollers	22UCS4AC6	4	3	3	25	75	100	
		Internship	Internship	22UCS4INT	-	2	-	-	-	100	
	IV	Generic Elective Course- II (GEC)	Multimedia (P)	22UCS4GEC2P	2	2	3	40	60	100	
			Basic Tamil – II	22ULC4BT2				25	75		
			Special Tamil - II	22ULC4ST2							
		Skill Enhancement Course – I (SEC)	Web Designing (P)	22UCS4SEC1P	2	2	3	40	60	100	
	Extra Credit Course			SWAYAM	As per UGC Recommendation						
		Total				30	25				800

Semester IV	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UCA3CC4 / 22UCS4CC4	DATABASE MANAGEMENT SYSTEMS	CORE	6	6

Course Objectives

- To understand the basic concepts and the applications of database systems
- To provide the basics of SQL and construct queries using SQL, E-R model and Normalization

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Define the basic concepts of database design, architecture and its data model	K1
CO2	Illustrate the structure of Relational database	K2
CO3	Apply the various queries in the database	K3
CO4	Examine the database design and E-R model	K4
CO5	Explain the concepts of Relational Database Design	K2, K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	2	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1”–Slight(Low) Correlation

“3”–Substantial (High) Correlation

“2”–Moderate(Medium)Correlation

“-”indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Introduction to Database System Concepts: Introduction – Database-System Applications – Purpose of Database Systems – View of Data: Data Abstraction - – Instances and Schemas – Data Models – Relational Databases: Tables – Data-Manipulation Language –Data-Definition Language – Database Design: Design Process – The Entity – Relationship Model – Normalization – Data Storage and Querying: Storage Manager – The Query Processor – Transaction Management – Database Architecture – Database Users and Administrators: Database Users and User Interfaces – Database Administrator.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Introduction to Relational Model and SQL: Structure of Relational Databases – Database Schema – Keys – Schema Diagrams – Relational Query Languages – Relational Operations - Introduction to SQL: Overview of the SQL Query Language – SQL Data Definition: Basic Types – Basic Schema Definition – Basic Structure of SQL Queries: Queries on Single Relation – Queries on Multiple Queries – The Natural Join.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Introduction to SQL: Additional Basic Operations: The Rename Operation –String Operations – Attributes Specification in Select Clause – Ordering the Display of Tuples – Where clause Predicates – Set Operations: The Union Operation – The Intersect Operation - Except Operation – Null Values – Aggregate Functions: Basic Aggregation – Aggregation with Grouping - The Having Clause - Nested Sub queries: Set Membership – Set Comparison – Modification of the Database.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Database Design and E-R Model: The Entity – Relationship Model: Entity Sets –Relationship Sets – Attributes – Constraints: Mapping Cardinalities – Keys – Entity-Relationship Diagrams: Basic Structure – Mapping Cardinality – Complex Attributes - Weak Entity Sets – Design Alternative: Smaller Schemas - Atomic Domains and First Normal Form Decomposition using Functional Dependencies: Keys and Functional Dependencies - Boyce-Codd Normal Form - BCNF and Dependency Preservation –Third Normal Form.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Relational Database Design: Functional Dependency Theory: Closure of a set of Functional Dependencies - Closure of Attribute Sets - Canonical Cover – Lossless Decomposition –Dependency Preservation. Transaction Management: Transaction Concepts -A Simple Transaction Model-Storage Structure-Transaction Atomicity & Durability -Transaction Isolation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	UNIT VI - Self Study for Enrichment (Not included for End Semester Examinations) SQL data types and Schemas - Reduction to Relational Schemas - ER design issues - E-R diagram for the University Enterprise.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. Abraham Sliberschatz, Henry F Korth & Sudharsan (2013). *Database System Concepts*, 6th Edition, McGraw Hill Education (India) Private Limited.

Reference Books

1. Alexis Leon, Mathews Leon (2009). *Essentials of Database Management Systems*, McGraw Hill Education India Pvt Ltd.
2. Peter Rob, Carlos Coronel (2009). *Database System Concepts*, Cengage Learning

Web References

1. <https://beginnersbook.com/2015/04/dbms-tutorial/>
2. <https://www.studytonight.com/dbms/>
3. <https://www.tutorialspoint.com/dbms/>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. Lakshna Arun, Associate Professor, Department of Computer Applications

Semester IV	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCS4CC5P	SQL & PL/SQL(P)	CORE	4	4

Course Objective

- To provide the depth programming knowledge of SQL
- Apply the fundamentals of DDL, DML, DCL and TCL
- Implement new developments and trends in developing a database

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall and demonstrate basic commands and functions in SQL and PL/SQL	K1, K2
CO2	Apply the knowledge of SQL concepts to develop a database system	K3
CO3	Examine the problem and provide a solution using SQL concepts	K4
CO4	Evaluate various concepts to develop simple applications using SQL	K5, K6
CO5	Solve the various types of online applications using SQL	K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	2	3	3	2	2	2	3	2	3	3
CO2	3	3	3	3	3	2	3	2	3	3
CO3	3	3	3	3	3	2	3	3	2	3
CO4	3	3	3	3	3	2	3	2	1	2
CO5	3	3	3	3	3	2	3	3	1	1

“1”-Slight (Low) Correlation
“3”-Substantial (High) Correlation

“2”-Moderate (Medium) Correlation
“-”-indicates there is no Correlation.

List of Exercises

USING SQL

1. DDL operations
2. DML operations
3. Set operations
4. Aggregate functions
5. Join operations
6. Nested subqueries
7. String operations
8. Report generation

USING PL/SQL

9. Raise an exception
10. Using Cursors
11. Using procedures
12. Using Triggers

Web References

1. <https://www.w3resource.com/>
2. <https://www.ntu.edu.sg/home/ehchua/programming/sql/>
3. <https://www.tutorialride.com/>

Pedagogy

Power Point Presentations, Demo by e-Contents tutorials

Course Designer

Ms. R. Sridevi

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCS4INT	INTERNSHIP	INTERNSHIP	-	2

- At the end of Semester I, the students should undergo an internship in a reputed IT company or IT division of reputed company
- Minimum number of days for the internship is 15 days
- A project report and a certificate of attendance are to be submitted after completing the internship

EVALUATION PATTERN FOR INTERNSHIP

Internal Components	Marks	External Components	Marks
Institution Profile	5	Regularity	10
Presentation skill	10	Problem solving	10
Report Evaluation	10	Participation and Hands – on training	20
		Professional Attitude	15
		Report Writing	20
Total	25	Total	75

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCS4GEC2P	MULTIMEDIA (P)	GENERIC ELECTIVE	2	2

Course Objective

- To learn and understand technical aspect of Multimedia Systems
- To give an overall view of multimedia tools
- To explore various photo editing features, animation techniques and demonstrate proficiency in developing the multimedia presentations

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Identify the basic tools and components of a multimedia	K1
CO2	Understand the use of graphical tools for various templates	K2
CO3	Apply basic elements and principles of photo editing software to achieve a great photo effect	K3
CO4	Discover layers, rotation and overlapping of an image	K4
CO5	Design a brochure for different situations and assess it	K5, K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	2	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	2	3	3	2	2	3	3	3
CO4	3	2	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight(Low) Correlation

“3”–Substantial (High) Correlation

“2”–Moderate(Medium) Correlation

“-”indicates there is no Correlation.

List of Exercises

USING FLASH

1. Create an animation to represent the Growing Moon
2. Create an animation for bouncing a ball
3. Change a Circle into a Square
4. Display the Background image given through your name using mask

USING PHOTOSHOP

5. Prepare a Booklet for a Seminar and apply the concept of feather effects
6. Design an Award certificate and organize with text and image tools
7. Design an invitation for Annual Sports Meet with creative colors and text.
8. You are given a picture of a garden as background. Extract the image of a butterfly from another picture and organize it on the background.
9. Given a picture, make three copies of this picture. On one of these pictures, adjust the brightness and contrast, so that it gives an elegant look. On the second picture, change it to grayscale and the third is the original one.
10. Convert the given image to a pencil sketch.
11. Import two pictures. Morph, Merge and Overlap the images.

Web References:

1. <http://tutorials4computer.blogspot.com/2015/02/procedure-to-create-animation-to.html>
2. <http://dte.kar.nic.in/STDNTS/CS%20IS/multimedia%20lab%20programs.pdf>
3. <https://www.adorama.com/alc/how-to-edit-your-photos-5-photoshop-editing-steps-for-beginners>

Pedagogy:

Power Point Presentations, Demo by e-Contents

Course Designer:

Ms.R.Rita Jenifer

Semester IV	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22UCS4SEC1P	WEB DESIGNING (P)	SKILL ENHANCEMENT	2	2

Course Objective

- To acquire knowledge and Skills for creation of Web Site
- To implement modern web pages with HTML, CSS and Javascript
- To develop static and dynamic web pages

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recognize the usage of tags and styles in web designing	K2
CO2	Plan to build a web site	K3
CO3	Analyze the various tags, styles and scripting in html and CSS and apply them in web page designing	K4
CO4	Assess the web page with different validation test cases	K5
CO5	Design dynamic web pages that apply various dynamic effects on the web site for real time applications.	K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	3	3	3	3	2	3	3
CO2	3	3	3	2	3	3	3	2	3	3
CO3	3	2	3	2	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	1	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight(Low) Correlation

“3”–Substantial (High) Correlation

“2”–Moderate(Medium) Correlation

“-”indicates there is no Correlation.

List of Exercises

USING HTML

1. Create a webpage using
 - Structure tag to display sample message
 - Different types of list.
 - Table tag
2. Insert a picture on the webpage using various attributes
3. Create a web page to link
 - A web page of same site
 - A specific location on a web page of same site
 - An external web page from a different website
4. Create a web page using frame
5. Embed Audio and Video into a web page.

USING CSS

6. Develop a style sheet
7. Create a form to accept inputs like name, age, address and favorite subject, movie and hobbies

USING JAVASCRIPT

8. Display current date and time
9. Create an interactive calculator
10. Create a form having the input type elements like checkbox, radio button, select option, text area and submit button, and validate the content
11. Write a program to display information box as soon as page loads.

CASE STUDY : Create a website

Web References

1. https://aits-tpt.edu.in/wp-content/uploads/2022/06/Web_Design_MANUAL-min.pdf
2. https://www.coursera.org/specializations/webdesign?utm_medium=institutions&utm_source=umich&utm_campaign=adwordswebdesignforeverybody&utm_term=%2Bbasic%20%2Bweb%20%2Bdesign%20%2Bcourse&gad=1&gclid=#about
3. <https://www.rgmcet.edu.in/assets/img/departments/CSE/materials/R15/3-2/WT%20LAB.pdf>
4. <https://www.jnec.org/labmanuals/cse/se/sem1/HTML-SY-PART-I.pdf>
5. https://www.w3schools.com/js/js_intro.asp

Pedagogy

Power point Presentations, Demo, E-Contents

Course Designer

Ms.S.Saranya



Cauvery College for Women (Autonomous), Trichy

PG & Research Department of Computer Science

B.Sc. Computer Science

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester V

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
V	III	Core Course – V(CC)	Python Programming	22UCS5CC5	6	6	3	25	75	100
		Core Practical – VI(CP)	Python Programming (P)	22UCS5CC6P	3	3	3	40	60	100
		Core Course - VI(CC)	Operating Systems	22UCS5CC6	6	6	3	25	75	100
		Core Course – VII(CC)	Computer Networks	22UCS5CC7	6	6	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. Computer Architecture	22UCS5DSE1A	5	4	3	25	75	100
			B. Computer Graphics	22UCS5DSE1B						
			C. Artificial Intelligence	22UCS5DSE1C						
	IV	Ability Enhancement Compulsory Course-IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	CISCO Packet Tracer (P)	22UCS5SEC2P	2	2	3	40	60	100
	Extra Credit Course			SWAYAM	As per UGC Recommendation					
Total					30	29	-	-	-	700

Semester: V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UCS5CC5	PYTHON PROGRAMMING	CORE	6	6

Course Objective

- To provide basic idea on functions and concepts of Python programming
- To inculcate the basic techniques of Python programming
- To do input/output with files in Python
- To learn how to build and packages python modules for reusability

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Identify the basic built-in functions and syntax of Python programming	K1
CO2	Discuss the concepts of arrays and file operations	K2
CO3	Illustrate external libraries and packages with python	K3
CO4	Analyze the concepts of decision making and construct statements	K4
CO5	Evaluate the concept of database	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	3	3	2	3	3	3	3	3	3
CO4	3	2	3	3	3	3	3	2	3	3
CO5	3	3	3	3	3	2	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” –indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Python- Features of Python- Comments in python- Identifiers and Reserved words - Data types in Python:- Built-in data types -Bool datatype- Sequences- Sets-Literals- Input and Output-Operators in Python	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Control statements- Arrays in Python: Creating an array-importing the array module- Indexing and Slicing-Processing the arrays-Working with array using Numpy -Mathematical operations on arrays - Comparing arrays - Working with single and multi-dimensional arrays - Attribute of an array.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Strings & Characters- Functions: Defining a function - Calling a function - Returning results and multiple values from a function - Pass by object reference - Formal and Actual arguments - Local and Global variables - Recursive function - Lambdas - Decorators – Generators	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Lists & Tuples - Dictionaries - Modules and Packages & Programming: Standalone Programs – Command-Line Arguments – Modules and the import Statement – Packages - The Python Standard Library	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Systems: Files – Directories – Programs and Processes – Calendars and Clocks. Graphical User Interfaces: GUI in Python – The Root Window – Fonts and Colors – Working with Containers – Canvas – Frame – Widgets – Button, Label, Text, Check button, Radio button, List box, Menu.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment: (Not included for End Semester Examinations) Python's Database Connectivity – MySQL - MongoDB.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Dr. R. Nageswara Rao.(2017). *Core Python Programming*. Dreamtech Press. (Unit I-V)
2. Bill Lubanovic.(2016). *Introducing Python*. 1st Edition, Third Release, O'Reilly (Unit IV-V)

Reference Books

1. Eric Matthes.(2019). *Python crash course*. 2nd edition, William Pollock
2. Allen B. Downey(2015). *Think Python*. 2nd edition, O'Reilly Publishers
3. Mark Lutz(2014). *Python Pocket Reference*. O'Reilly Media
4. Wesley J. Chun(2009). *Core Python Programming*. Prentice Hall

Web References

1. <http://greenteapress.com/wp/thinkpython>
2. <http://www.tutorialspoint.com/python/>
3. <http://www.learnpython.org/>
4. <http://www.codecademy.com/en/tracks/python>
5. <http://www.pyschools.com/>
6. <https://nptel.ac.in/courses/106106145>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designers

1. Ms. S. Udhaya Priya
2. Ms. P. Muthulakshmi

Semester: V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UCS5CC6P	PYTHON PROGRAMMING (P)	CORE	3	3

Course Objective

- To read, write and debug simple Python programs
- To implement python programs with looping statement
- To represent compound data using python lists, tuples and dictionaries
- To implement in real time environment with database connectivity

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Identify the basic concepts of Python	K2
CO2	Write and debug simple Python programs with loops and conditions	K3
CO3	Use Python lists, tuples, dictionaries for representing compound data and apply file concept in Python	K3
CO4	Developing simple applications using Database Connectivity	K3
CO5	Construct Python programs step-wise by defining functions and calling them	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	3	3	2
CO2	3	3	3	3	2	3	3	2	3	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	2	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no Correlation.

List of Exercises

1. List and their built-in functions
2. Implementing Tuples
3. Working with Dictionaries
4. Strings and their built-in functions
5. Implementing Functions with Flow control
6. Packages and Modules
7. File Operations
8. Working with MySQL Database
9. Working with Libraries
10. Working with GUI

Web References

1. <https://www.w3resource.com/python-exercises/>
2. <https://cocalc.com/>
3. <https://www.codechef.com/ide>
4. <https://www.geeksforgeeks.org/data-analysis-visualization-python/>
5. <https://www.edureka.co/blog/python-regex/>

Pedagogy

Power Point Presentation, Live Demonstration

Course Designers

1. Ms. S. Udhaya Priya
2. Ms. P. Muthulakshmi

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UIT5CC5/ 22UCS5CC6	OPERATING SYSTEMS	CORE	6	6

Course Objectives

- To understand the basic concepts of operating system
- To know the responsibilities of the operating system
- To get in depth knowledge of various scheduling algorithm for efficient resource management
- To acquire the knowledge of file management

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand the conceptual view of Operating systems	K1
CO2	Comprehend how an operating system provides an abstracted interface to the hardware resources	K3
CO3	Apply various scheduling algorithms for efficient resource utilization.	K3
CO4	Analyze the role of synchronization to improve system performance	K3, K4
CO5	Implement the functionalities pertaining with process, File and I/O Management.	K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	2	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	3	3	2	3	3	3	3	3	3
CO4	3	2	3	3	3	3	2	2	3	3
CO5	3	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Operating System Overview: Operating System Objectives and Functions- Evolution of Operating Systems - Major AchievementsDevelopments Leading to Modern Operating Systems	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Process: What Is a Process? - Process States: Creation and Termination of Processes - Five-State Model - Process Description: Operating System Control Structures- Process Control Structures - Process Control -Modes of Execution - Process Creation - Process Switching – Threads: Processes and Threads – Types of Threads – Uniprocessor Scheduling: Types of Processor Scheduling - Scheduling Algorithms: Short-Term Scheduling Criteria - Use of Priorities - Alternative Scheduling Policies	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Principles of Concurrency - Mutual Exclusion - Semaphores – Monitors: Monitor with Signal - Message Passing - Principles of Deadlock - Deadlock Prevention - Deadlock Avoidance Deadlock Detection Deadlock Detection.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Memory ManagementRequirements - Memory Partitioning: Fixed Partitioning - Dynamic Partitioning - Relocation - Paging – Segmentation – Virtual Memory - Hardware and Control Structures -Locality and Virtual Memory - Paging – Segmentation - Combined Paging and Segmentation - Operating System Software: Fetch Policy - Placement Policy - Replacement Policy	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Disk Scheduling: Disk Performance Parameters - Disk Scheduling Policies – File Management: Overview - File Organization and Access - File Directories - File Sharing - Record Blocking -File System Security	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self-Study for Enrichment (Not included for End Semester Examinations) OS Design Considerations for Multiprocessor and Multicore, 7 UNIX SVR4 Process Management, Buddy System, Traditional UNIX Scheduling		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Text Book

1. William Stallings. (2018). *Operating Systems Internals and Design Principles* ,9th Edition, Prentice Hall,

Reference Books

1. Andrew S.Tanenebaum (2011), *Operating Systems and Design Implementation*, 3rd Edition, Pearson Education
2. Abraham Silberschatz, Perter Baer Galvin, Greg, (2010), *Operating System Concepts*, 8th Edition John Wiley & Sons.
3. Rohit Khurana (2014), *Operating Systems*, 2nd Edition, Vikas Publishing House Ltd.

Web References

1. <https://www.geeksforgeeks.org/what-is-an-operating-system>
2. <https://www.gatevidyalay.com/operating-system/>
3. <https://www.javatpoint.com/operating-system>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

1. Dr. P.Tamilselvi, Associate professor, Department of Information Technology

Semester: V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UCS5CC7	COMPUTER NETWORKS	CORE	6	6

Course Objective

- To introduce the fundamental types of computer networks
- To demonstrate the TCP/IP & OSI model merits & demerits
- To know the role of various protocols in Networking

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand and recall the basics of computer Networks	K1, K2
CO2	Explain network architecture using protocols and interfaces.	K2
CO3	Apply the network concepts in problem solving	K3
CO4	Analyzing key networking protocols and their hierarchical relationship	K4
CO5	Determine the need of data link, network and transport layers on real time applications	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	3	3	2	3
CO2	3	2	2	2	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	2	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Data Communications – Networks - Network Types – Internet History – Standards and Administration. Network Models: Protocol Layering – TCP/IP Protocol Suite – The OSI Model.	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Physical Layer: Guided Transmission Media. Wireless Transmission – From Waveforms to Bits: Multiplexing - The Public Switched Telephone Network: Switching - Data and Signals – Digital Transmission: Transmission Modes.	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Data-Link Layer: Design Issues– Error Detection and Correction – Medium Access Control Sublayer: Multiple Access Protocols: Carrier Sense Multiple Access Protocols, Collision-Free Protocols - Bluetooth: Bluetooth Architecture, Bluetooth Applications - Data Link Layer Switching: Uses of Bridges, Learning Bridges, Repeaters, Hubs, Bridges, Switches, Routers and Gateways	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Network Layer: Design Issues - Routing Algorithm in a Single Network: Shortest Path Algorithm, Distance Vector Algorithm, Link State Routing – Traffic Management at the Network Layer - Quality of Service and Application QOE: Application QoS Requirements - Internetworking: Internetwork Routing: Routing Across Multiple Networks – Supporting Different Packet Sizes: Packet Fragmentation. The Network Layer in the Internet: The IP Version4 Protocol – IP Addresses	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Transport Layer: Services – Connectionless and Connection-Oriented Protocols. Transport Layer Protocols: User Datagram Protocol – Transmission Control Protocol: TCP Services, TCP Features, Flow Control, Error Control, TCP Congestion Control	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment: (Not included for End Semester Examinations) Ethernet – The Domain Name System – Electronic Mail – File Transfer Protocol – The World Wide Web – Hypertext Mark-up Language - Cryptography and Network Security	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Behrouz A. Forouzan. (2021). *Data Communications and Networking*. 5th Edition, McGraw Hill Education.
Unit 1: Chapter 1 & 2
Unit 2: Chapter 3: 3.1 & Chapter 4: 4.3
Unit 5: Chapter 23: 23.1, 23.2.2, 23.2.3 &
Chapter 24: 24.2, 24.3.1, 24.3.2, 24.3.7, 24.3.8, 24.3.9
2. Andrew S Tanenbaum, Nick Feamster, David Wetherall. (2021). *Computer Networks*. 6th Edition, Pearson Education.
Unit 2: Chapter 2: 2.1, 2.2, 2.4.4, 2.5.4
Unit 3: Chapter 3: 3.1, 3.2 & Chapter 4: 4.2.2, 4.2.3, 4.5.1, 4.5.2, 4.7.1, 4.7.2, 4.7.4
Unit 4: Chapter 5: 5.1, 5.2.2, 5.2.4, 5.2.5, 5.3, 5.4.1, 5.5.5, 5.5.6, 5.7.1, 5.7.2

Reference Books

1. James F Kurose and Keith W. Ross. (2017). *Computer Networking A Top-Down Approach*. 6th Edition, Pearson Education
2. Larry L. Peterson and Bruce S. Davie. (2020). *Computer Networks: A Systems Approach*. 6th Edition, Morgan Kaufmann.

Web References

1. <https://www.coursera.org/courses?query=computer%20network>
2. <https://www.geeksforgeeks.org/basics-computer-networking/>
3. <https://www.javatpoint.com/computer-network-tutorial>
4. https://www.tutorialspoint.com/computer_fundamentals/computer_networking.htm
5. <https://www.youtube.com/playlist?list=PLxCzCOWd7aiGFBD2-2joCpWOLUrDLvVV>
6. <https://archive.nptel.ac.in/courses/106/105/106105080/>
7. <https://archive.nptel.ac.in/courses/106/105/106105183/>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designers

1. Dr. V. Sinthu Janita Prakash
2. Ms. R. Sangeetha

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UCS5DSE1A	COMPUTER ARCHITECTURE	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objective

- To conceptualize the basics of organizational and architectural issues of a digital computer
- To analyze performance issues in processor and memory design of a digital computer
- To demonstrate various data transfer techniques in digital computer
- To evaluate processor performance improvement using instruction level parallelism

Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Define the basics of digital computer	K1
CO2	Explain the various concepts of digital computer	K2
CO3	Utilize the numerous digital computer tools to address the issue	K3
CO4	Examine the digital computer's performance	K4
CO5	Solve the real-time problem using digital computer	K5

Mapping of CO with PO and PSO

CO s	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	2	2	2	2	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Basic Computer Organization and Design: Instruction Codes- Computer Registers- Computer Instructions- - Timing and Control -Instruction Cycle- Memory Reference Instructions – Input – Output and Interrupt.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Central Processing Unit: General Register Organization - Stack Organization - Instruction Formats - Addressing Modes- Data Transfer and Manipulation - Program control.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Memory Organization: Memory Hierarchy- Main Memory- Auxiliary Memory- Associative Memory- Cache Memory- Virtual Memory	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Introduction to Parallel Processing: Parallelism in Uniprocessor Systems – Parallel Computer Structures- Architectural Classification Schemes- Parallel Processing Applications – Predictive Modeling and Simulations- Engineering Design and Automation.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Pipeline and Vector Processing: Parallel Processing- Pipelining- Arithmetic Pipelines – Instruction Pipeline – RISC Pipeline- Vector Processing- ArrayProcessors	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	UNIT VI - Self Study for Enrichment (Not to be included for External Examination) Bus organization – Design of Basic Computers - Reduced Instruction Set Computer- Memory Management Hardware	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. M. Morris Mano,(2011). "*Computer System Architecture*", 3rd Edition, Pearson.
(Unit I-III, V)
2. Kai Hwang,Faye A Briggs,(2017). "*Computer Architecture and Parallel Processing*", McGraw Hill Education (India) Private Limited. **(Unit IV)**

Reference Books

1. Carl Hamacher,(2011). "*Computer Organization*", 3rd Edition, Tata McGraw Hill.
2. John P Hayes,(2017). "*Computer Architecture and Organization*", 5th Edition Tata McGraw Hill.
3. William Stallings,(2016). "*Computer Organization and Architecture*", 5th Edition, Pearson Education.

Web References

1. [https:// en.wikipedia.org](https://en.wikipedia.org)
2. [https:// home.ustc.edu.cn](https://home.ustc.edu.cn)
3. [https:// ict.iitk.ac.in](https://ict.iitk.ac.in)
4. www.geeksforgeeks.org
5. <https://archive.nptel.ac.in/courses/106/105/106105163/>
6. <https://www.youtube.com/playlist?list=PLeUP77TwO-u4983ut7fFLjgBfKXL-YTeA>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designers

1. Dr.V.Sinthu Janita Prakash
2. Ms. R. Sridevi

Semester V	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UCS5DSE1B	COMPUTER GRAPHICS	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objective

- To understand the basics of Graphical Mechanisms
- To provides the fundamentals of computer graphics and Augmented Reality
- To focuses on 2D, 3D transformations & viewing

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall the fundamentals of computer graphics and augmented reality	K1
CO2	Provide a insight of computer graphics and algorithms	K2
CO3	Apply computer graphic algorithms to solve problems	K3
CO4	Illustrate the steps to perform 2D & 3D graphic representation in applications	K4
CO5	Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.	K5

Mapping with Programme Outcomes

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO 1	3	2	3	3	2	3	3	1	3	2
CO 2	3	3	3	3	3	3	3	3	3	3
CO 3	3	3	3	3	3	3	3	2	3	3
CO 4	3	3	3	3	3	3	3	3	3	3
CO 5	3	2	3	3	3	3	3	2	3	3

“1”– Slight(Low) Correlation

“3”– Substantial (High) Correlation

“2”– Moderate(Medium) Correlation

“-” – indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Computer Graphics Hardware: Video Display Devices – Raster Scan Systems – Graphics Workstations and Viewing Systems - Input Devices – Hardcopy Devices. Computer Graphics Software - Coordinate Representations - Graphics Functions - Software Standards - Other Graphics Packages - Introduction to OpenGL	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Attributes of Graphics Primitives: Color and Grayscale –Line Attributes - OpenGL Line-Attribute Functions - Curve Attributes - Fill-Area Attributes - OpenGL Fill-Area Attribute Functions - Character Attributes - OpenGL Character-Attribute Functions - OpenGL Antialiasing Functions - OpenGL Query Functions - OpenGL Attribute Groups. Implementation Algorithms for Graphics Primitives and Attributes: Line-Drawing Algorithms - Setting Frame-Buffer Values -Circle-Generating Algorithms	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Two-Dimensional Geometric Transformations: Basic Two-Dimensional Geometric Transformations – Matrix Representations and Homogeneous Coordinates - Two-Dimensional Composite Transformations – Other Two-Dimensional Transformations. Two-Dimensional Viewing - Normalization and Viewport Transformations - Clipping Algorithms- Two-Dimensional Point Clipping - Two-Dimensional Line Clipping: Cohen-Sutherland Line Clipping- Polygon Fill-Area Clipping: Sutherland-Hodgman Polygon Clipping - Curve Clipping - Text Clipping	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Three Dimensional Geometric Transformations: Three-Dimensional Translation - Three-Dimensional Rotation - Three-Dimensional Scaling - Other Transformation. Visible Surface Detection Methods: Classification of Visible Surface Detection Algorithm - Backface Detection – Depth-Buffer Method – A-Buffer Method – Scan-Line Method - Applications of Computer Graphics.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Augmented Reality: Definition - Components of Augmented Reality - History of Augmented Reality - Augmented Reality - Differences between Augmented Reality and Virtual Reality - Difference between AR and QR Codes - Challenges with AR - Opportunities for Augmented Reality - Types of Augmented Reality - Augmented Reality Working - Augmented Reality Methods - AR Display Technology - Interaction in AR Applications	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Value of Augmented Reality: Next User Interface - Uses of Augmented Reality: Sports, Gaming, and Entertainment, Education - Maintenance and Repair - Medicine - Business and Commerce	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Donald Hearn, Pauline Baker, Warren Carithers. (2014), *Computer Graphics with Open GL*, 4th Edition, Pearson Education. Limited. **(Units I -IV)**
2. Gregory Kipper, Joseph Rampolla. (2012), *Augmented Reality: An Emerging Technologies Guide to AR*, Elsevier Science. **(Unit-V)**

Reference Books

1. Shalini Govil-pai. (2010), *Principles of Computer Graphics: Theory and Practice Using OpenGL and Maya*, 1st edition, Springer-Verlag.
2. F.S. Hill, Jr, Stephen M. Kelley. (2007), *Computer Graphics Using OpenGL*, 3rd Edition, Pearson Education
3. Jay David Bolter, Morya Engberg, Blair MacIntyre. (2021), *Reality Media Augmented & Virtual Reality*, The MIT Press, Cambridge.
4. Jonathan Linowes. (2021), *Augmented Reality with Unity AR Foundations*, Packt Publishing

Web References

1. <https://nptel.ac.in/courses/106106090>
2. <https://archive.nptel.ac.in/courses/106/103/106103224/>
3. <https://doc.lagout.org/programmation/OpenGL/Computer%20Graphics%20with%20OpenGL%20%284th%20ed.%29%20%5BHearn%2C%20Baker%20%26%20Carithers%202013%5D.pdf>
4. https://www3.ntu.edu.sg/home/ehchua/programming/opengl/CG_BasicsTheory.html
5. <https://www.acsce.edu.in/acsce/wp-content/uploads/2020/03/CG-Module-1.pdf>
6. <https://dynamics.microsoft.com/en-in/mixed-reality/guides/what-is-augmented-reality-ar/>
7. <https://www.linkedin.com/pulse/what-value-augmented-reality-filipa-d-orey>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar

Course Designers

1. Dr.A.R.Jasmine Begum
2. Ms.A.Sahaya Jenitha
3. Ms.S.Saranya

Semester V	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UCS5DSE1C	ARTIFICIAL INTELLIGENCE	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objective

- To understand the need of Artificial Intelligence (AI)
- To study the basic concepts on AI problems and techniques
- To apply the knowledge representation into a new situation
- To build an AI system for the small level house hold activities

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO 1	Recall the need of AI and the Knowledge representation	K1
CO 2	Understand the AI problems & AI techniques	K2
CO 3	Apply various AI techniques on demand	K3
CO 4	Analyze AI algorithms with use cases	K4
CO 5	Evaluate AI techniques for real time situations	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	3	3	2	2
CO2	3	3	2	2	3	3	3	3	3	3
CO3	3	2	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	2	3	3	3	3	3	3	3	3	3

“1”-Slight (Low) Correlation
“3”-Substantial (High) Correlation

“2”-Moderate (Medium) Correlation
“-”- indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Artificial Intelligence: The AI Problems – AI Technique – Criteria for Success. Problems, Problem Spaces and Search: Defining the problem as a State Space Search – Production System- Problem Characteristics.	13	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Heuristic Search Techniques : Generate and Test- Hill Climbing – Best-First Search – OR Graph – A * Algorithm – Problem Reduction – AND-OR Graphs- AO* Algorithm- Constraint Satisfaction – Means- Ends Analysis. Knowledge Representation Issues: Representation and Mappings – Approaches to Knowledge Representations.	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Using Predicate Logic: Representing Simple facts in Logic – Representing Instance and ISA Relationships- Computable Functions and Predicates – Resolution. Representing Knowledge Using Rules: Procedural versus Declarative Knowledge – Logic Programming – Forward versus Backward Reasoning.	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Symbolic Reasoning Under Uncertainty: Introduction to Nonmonotonic Reasoning – Logics for Nonmonotonic Reasoning- Implementation Issues – Augmenting a Problem Solver. Statistical Reasoning: Probability and Baye's Theorem – Certainty Factors and Rule Based Systems – Bayesian Network.	13	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Weak slot and filler structures: Semantic Nets-Frames - Strong slot and Filler structures: Conceptual Dependency-Scripts-CYC Knowledge Representation Summary: Syntactic semantic spectrum of representation -Logic and Slot -and - Filler Structures.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Machine Learning : Introduction – Data Analysis and Machine Learning- Fundamental approaches-Supervised Machine Learning – Reinforcement Machine Learning – Unsupervised Machine Learning – Semi- supervised Learning Applications of AI : AI in ecommerce – AI in E-Tourism – AI in industry – AI in medicine	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. Elaine Rich, Kevin Knight, Shivashankar B Nair, (2017), *Artificial Intelligence*, 3rd edition, Tata McGraw Hill.

Reference Books

1. Rajendra Akerkar (2014), *Introduction to Artificial Intelligence*, 2nd edition, PHI Learning Pvt Ltd.
2. Stuart Russell, Peter Norvig (2010), *Artificial Intelligence: A Modern Approach*, 3rd edition, Pearson Education

Web References

1. <http://aimaterials.blogspot.com/>
2. <http://zsi.tech.us.edu.pl/>
3. https://www.tutorialspoint.com/artificial_intelligence/
4. https://www.vssut.ac.in/lecture_notes/lecture1428643004.pdf
5. <https://nptel.ac.in/courses/106105077>

Pedagogy

Chalk and Talk, Group discussion, PPT, ICT

Course Designers

1. Ms.N.Girubagari
2. Ms.K.Pradeepa

Semester V	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UCS5SEC2P	CISCO PACKET TRACER (P)	SKILL ENHANCEMENT COURSE	2	2

Course Objective

- To understand the working principle of CISCO Packet Tracer technology
- To inculcate knowledge in configuration of switching
- To know the concepts of static and dynamic routing

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Demonstrate the installation of CISCO Packet Tracer	K2
CO2	Make use of Switch Interface	K3
CO3	Examine the need of VLAN	K4
CO4	Evaluate the router setup and static routing	K5
CO5	Assess the dynamic routing in CISCO Packet Tracer	K5

Mapping of CO with PO and PSO

CO s	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	2	2	3	3	2	2	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight(Low) Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High) Correlation

“-”indicates there is no Correlation.

List of Exercises

1. Installation of CISCO Packet Tracer
2. Configuration of CISCO Packet Tracer
3. Basic Switch Setup
4. Configuring Switch Interfaces
5. VLAN and VTP Configuration
6. Basic Router Setup
7. Configuration of Static Routes
8. Configuration of IP Routing using RIP

Web References

1. https://booksite.elsevier.com/9780123850591/Lab_Manual/Lab_04.pdf
2. <https://www.networkcomputing.com/data-centers/comparing-dynamic-routing-protocols>
3. <https://skillsforall.com/course/getting-started-cisco-packet-tracer>
4. <http://freeciscolab.com/category/lab-scenarios/>
5. <http://freeccnlab.com/>
6. https://virl.scsiraidguru.com/?page_id=858
7. <https://www.packettracernetwork.com/labs/lab1-basicswitchsetup.html>
8. <https://archive.nptel.ac.in/courses/106/101/106101209/>

Pedagogy

Power Point Presentation, Demonstration

Course Designers

1. Dr.H.Krishnaveni
2. Ms.R.Rita Jenifer

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC
ISO 9001:2015 Certified
TIRUCHIRAPPALLI

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE



B.Sc Computer Science with Cognitive Systems
2023-2024 and onwards



Cauvery College for Women (Autonomous), Trichy

PG & Research Department of Computer Science

B.Sc Computer Science with Cognitive Systems

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2023-2024 and onwards)

Semester - I

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC)	பொதுத்தமிழ்-1	23ULT1	6	3	3	25	75	100
			Hindi ka Samanya Gyan aur Nibandh	23ULH1						
			Poetry, Grammar and History of Sanskrit Literature	23ULS1						
			Foundation Course: Paper I - French I	23ULF1						
	II	English Language Course- I (ELC)	General English -I	23UE1	6	3	3	25	75	100
	III	Core Course – I (CC)	IT Cognition and Problem Solving	23UCG1CC1	3	3	3	25	75	100
		Core Practical - I (CP)	Problem Solving Using Advanced Excel (P)	23UCG1CC1P	3	3	3	40	60	100
		Core Course – II (CC)	Operating Systems (T & P)	23UCG1CC2	4+2	5	2	50*	50*	100
		First Allied Course- I (AC)	Numerical Methods	23UCG1AC1	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course- I (AECC)	Value Education	23UGVE	2	2	-	100	-	100
Total					30	22				700

T&P: ESE:50 (Theory Exam), CIA: 50*(Practical: 40+Theory:10)

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
23UCG1CC1	IT COGNITION AND PROBLEM SOLVING	CORE	3	3

Course Objective

- To enable the learners to understand the concepts of cognitive process
- To empower the learners with the skills required for virtual collaboration and cultural sensitivity

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO	Course Outcomes	Cognitive Level
CO1	Understand the foundations of computer science	K1
CO2	Acquire a comprehensive understanding of cognitive systems	K2
CO3	Apply cognitive techniques to problem-solving	K3
CO4	Analyze the integrating computer science principles and acquire the skills to design and develop cognitive systems	K4
CO5	Evaluate and optimize cognitive system performance	K5

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	1	2	2	2	1	1
CO2	3	3	3	2	2	3	3	2	2	2
CO3	3	3	3	3	3	3	3	3	2	2
CO4	3	3	3	3	3	3	3	2	2	1
CO5	3	3	3	3	3	3	3	3	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – Indicates there is no Correlation

Syllabus

Unit	Content	Hours	COs	Cognitive Level
I	Introduction to Cognition: Meaning cognitive processes, Development of cognitive psychology: Structuralism, Functionalism, Behaviorism, Memory Research, Gestalt psychology, Emergence of cognitive psychology, Information Processing, Connectionism, Alternate approaches to cognitive psychology, Research Methods in Cognitive Psychology.	8	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Perceptual Processes: Object Recognition- theories of object recognition, Bottom- Up and Top-Down Processing, Face Perception, Change Blindness. Attention: Divided attention, Selective: Varieties, Subliminal Perception. Visual Perception- Perceptual Organizational -Processes, Multi sensory interaction and Integration – Synthesis, Comparing the senses, Perception and Action.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Memory- Working Memory: Research on Working Memory, Factors affecting the capacity of working Memory, Baddeley's Working Memory Approach. Long Term Memory: Encoding and Retrieval in Long Term Memory, Autobiographical Memory. Memory Strategies: Practice, Mnemonics using Imagery, Mnemonics using organization, The Multimodal Approach, Improving Prospective Memory. Meta cognition: Meta memory, TOT, Meta comprehension.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Problem Solving, Reasoning and Decision Making: VUCA World Problem Solving–Types of problem, Understanding the problem, Problem-Solving Approaches, Factors that influence Problem Solving, creativity, Reasoning – Inductive and Deductive Reasoning Decision Making – Heuristics in decision making – representativeness, availability and anchoring and adjustment. The Framing effect, Overconfidence in decisions, The Hindsight Bias.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Future Skills: Critical thinking, Adaptive thinking, Cognitive Load Management, Design thinking, Virtual Collaboration and Cultural Sensitivity.	7	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self Study for Enrichment: (Not to be included for End Semester Examinations) Language Production and Bilingualism: Speaking – Producing a word, producing a sentence, speech errors, producing discourse. Writing – Cognitive model of writing, planning the writing assignment. Bilingualism and Second Language Acquisition – Background and advantages of bilingualism.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Suggested Readings

1. Matlin, M.W. (2003). *Cognition* (5th Edition). Wiley Publication.
2. Riegler, B.R., Reigler, G.L. (2003). *Cognitive Psychology—Applying the Science of Mind* V (2nd Edition). Pearson Education.
3. Benjafield, J.G. (2007). *Cognition* (3rd Edition). Oxford University Press.
4. Goldstein, B.E. (2008). *Cognitive Psychology* (2nd Edition). Wadsworth.

Web References

1. https://sjsu.edu/people/mark.vanselst/courses/p135/s1/Kellogg_c1_fall2013.pdf
2. <https://jvpartners.com/problem-solving-and-decision-making-in-a-vuca-environment/>
3. <https://plato.stanford.edu/entries/critical-thinking/>

Pedagogy

Chalk & Talk, PowerPoint Presentation

Course Designer

Ms.J.Jesinth Jenifer

Semester I	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
23UCG1CC1P	PROBLEM SOLVING USING ADVANCED EXCEL (P)	CORE	3	3

Course Objective

- To perform basic calculations and formatting
- To inculcate the knowledge of Macros
- To analyze the given data and generate reports

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand the basic functions in worksheets	K2
CO2	Writing simple functions to perform simple tasks	K3
CO3	Develop the user forms	K3
CO4	Applying functions in generating reports	K3
CO5	Import and Export Data from different applications	K5

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	2	2	2
CO2	3	3	3	2	3	2	3	2	3	2
CO3	3	2	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	3	3	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

List of Exercises

MS EXCEL

1. Excel worksheet for Formatting, Math function and Text function
2. Excel worksheet for Graph Function
3. Working with Sheets
4. Working with Workbooks
5. Data Analysis
6. Data Visualization
7. Import/ export data
8. User forms
9. Generating Reports

Software Essentials: Microsoft office 2019

Web References

1. <https://www.excel-exercise.com/beginner/>
2. <https://trumpexcel.com/excel-macro-examples/>

Pedagogy

Power point Presentation, Demonstration

Course Designer

Ms.P.Muthulakshmi

Semester I	Internal Marks: 50		External Marks:50		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK		CREDITS
23UCG1CC2	OPERATING SYSTEMS (T & P)	CORE	T	P	5
			4	2	

Course Objective

- To provide the basic Operating System structure, process management, synchronization and CPU scheduling
- To inculcate knowledge about deadlock, memory management, virtual memory, file concepts and user authentication
- To provide Skills on installation of client / server windows in Virtual machine

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall and Understand the basic concepts of Operating System	K1, K2
CO2	Analyze and Categorize the components of Operating System	K3, K4
CO3	Examine and Explain the performance of Operating System services	K4, K5
CO4	Identify and Apply the appropriate methods or instructions to manage the resources	K3, K5
CO5	Compare and Interpret the functionalities of Operating Systems	K4, K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	3	2	3	3
CO2	3	2	3	3	3	3	2	2	3	3
CO3	3	3	3	3	2	3	3	2	3	3
CO4	2	2	2	2	2	2	2	2	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no Correlation

Syllabus: Theory:

Unit	Content	Hours	COs	Cognitive Level
I	Introduction: What Operating Systems Do - Operating System operations. Operating System Structures: Operating System Services - User and Operating System Interface – System Calls- System Programs - Operating System Design and Implementation – Operating System Debugging-Operating System Generation - Types of System Calls	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Process Management: Process Concept - Process Scheduling - Operations on Processes. Threads: Overview - Multicore Programming – Multithreading Models. Process Synchronization: Synchronization Hardware - Mutex Locks - Semaphores. CPU Scheduling: Basic Concepts- Scheduling Criteria - Scheduling Algorithms - Thread Scheduling	14	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Deadlocks: System Model - Deadlock Characterization - Methods for Handling Deadlocks- Deadlock Prevention- Deadlock Avoidance- Deadlock Detection- Recovery from Deadlock. Memory Management: Address Binding –Dynamic Loading and Linking- Logical and Physical Address Space-swapping- Contiguous Allocation- Internal & External Fragmentation.	14	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Non-Contiguous Allocation: Paging - Implementation – Hardware – Protection – Sharing - structure of page table – Segmentation Virtual Memory: Demand Paging-Page Replacement - Page Replacement Algorithms- Thrashing	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	File System Interface: File Concepts-Access Methods -Directory Structures -Protection - Consistency Semantics- File System Structures– Allocation Methods-Free Space Management. Security: Security Problems –Program Threats – System and Network Threats – User Authentication	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self study for Enrichment (Not to be included for End semester Examinations) Installation of various OS – create and run virtual machine with Hyper-V – Configure IPv4 and IPv6-Group policy management - virtualization in cloud computing	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book:

1. Silberschatz, Galvin, Gagne (2018). *Operating System Concepts*, 10th Edition, John Wiley Private Limited

Reference Books:

1. Milan Milenkovic (2001). *Operating Systems: Concepts and Design*. McGraw-Hill
2. Andrew S. Tanenbaum, (2001). *Modern Operating Systems*. 2nd Edition, Prentice Hall of India
3. Deital and Deital (1990). *Introduction to Operating System*. 3rd Edition, Pearson Education
4. William Stallings (2017). *Operating Systems*. Pearson Education

Web References:

1. http://www.tutorialspoint.com/operating_system/
2. <http://www.reallylinux.com/docs/files.shtml>
3. http://www.tutorialspoint.com/operating_system/os_linux.htm
4. <http://www.ics.uci.edu/~ics143/lectures.html>
5. *Operating Systems - Silberschatz, Galvin*
6. *Operating System – Neso Academy*

Practical:

List of Exercises

1. Installation of client Windows 10 in Virtual machine
2. Installation of Windows server 2016 in Virtual machine
3. Add roles and features
4. Disk Partitioning in MBR and GPT
5. Server Backup
6. Configuring Active Directory domain service
7. Configuring, managing and installation of DNS
8. Configuring, managing and installation of DHCP
9. IIS Configuration and Deployment
10. Mapping network drive

Text Books:

1. William PanekTylorWentworth.(2010).*Microsoft Windows 7 Administration*. Wiley Publishing
2. William PanekTylorWentworth.(2016).*Microsoft Windows 10*. Wiley Publishing
3. William PanekTylorWentworth.(2015).*Microsoft Windows server 2012 R2*.Wiley Publishing

Reference Books:

1. Mitch Tulloch.(2009).*Deploying Windows 7 Essential Guidance*. Microsoft Press
2. Charles Edge, Chris Barker Ehren Schwiebert.(2010).*Beginning Mac OSX Snow Leopard Server*. Paul Manning
3. Greg Tomsho.(2017).*Guide to Operating System*.5thEdition,Cengage Learning

Web References:

1. [Windows 10 Tutorial](#)
2. [Windows Server Administration for Beginners](#)
3. [Windows Server 2016 Tutorial Step by Step Full](#)
4. [Windows Server deployment, configuration, and administration](#)
5. <https://learn.microsoft.com/en-us/troubleshoot/windows-server/networking/install-configure-dhcp-server-workgroup>
6. <https://www.youtube.com/watch?v=UQiJzHYhkaw>

Pedagogy

Chalk & Talk, PowerPoint Presentation, Demonstration, e-Content

Course Designer

Dr.K.Reka



Cauvery College for Women (Autonomous), Trichy

PG & Research Department of Computer Science

B.Sc Computer Science with Cognitive Systems

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2023 - 2024 and onwards)

Semester -II

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. /week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
II	I	Language Course-II(LC)	பொதுத்தமிழ்- II	23ULT2	6	3	3	25	75	100
			Hindi Literature &Grammar-II	22ULH2						
			Prose, Grammar and History of Sanskrit literature	23ULS2						
			Basic French-II	22ULF2						
	II	English Language Course-II(ELC)	General English - II	23UE2	6	3	3	25	75	100
	III	Core Course– III(CC)	Java Programming	23UCG2CC3	4	4	3	25	75	100
		Core Practical-II(CP)	Java Programming (P)	23UCG2CC2P	2	2	3	40	60	100
		Core Course– IV(CC)	Information Technology Infrastructure Library	22UCG2CC4	2	2	3	25	75	100
		First Allied Course–II(AC)	Statistics	22UCG2AC2	4	3	3	25	75	100
		First Allied Course–III(AC)	Operations Research	22UCG2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
	Total				30	22				800

Semester II	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
23UCG2CC3	JAVA PROGRAMMING	CORE	4	4

Course Objective

- To provide the basic OOPs concepts in Java
- To comprehend building blocks of OOPs language, inheritance, package and interfaces
- To identify exception handling methods in Java
- To develop GUI based desktop application in project-based learning

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand OOPs concepts.	K1
CO2	Demonstrate the concept of Object Oriented programming through Java	K2
CO3	Apply the concept of interface, exceptions and threads to develop Java programs	K3
CO4	Develop Java program using Collection Interfaces	K4
CO5	Explain the Java program with Collection Interfaces and Classes	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3	2	3	2	3	2
CO2	3	3	3	3	3	2	3	2	3	3
CO3	2	3	3	3	3	2	3	2	3	3
CO4	2	3	3	3	3	2	3	2	3	2
CO5	2	3	3	3	2	2	3	2	3	3

“1”-Slight(Low) Correlation

“3”-Substantial(High) Correlation

“2”-Moderate(Medium) Correlation

“-”-Indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamentals of Object-Oriented Programming: Basic Concepts of Object-Oriented Programming-Benefits and Applications of OOP. Overview of Java Language: Java Program Structures, Statements– Constants, Variables and Data Types: Constants-Variables – Data Types – Declaration of Variables – Giving Values to Variables–Scope of Variables–Symbolic Constants-Type Casting.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Operators and Expressions: Introduction – Arithmetic Operators-Relational Operator-Logical Operator-Assignment Operator-increment and decrement Operator-Conditional Operator-Bitwise Operator-Special Operator - Decision Making and Branching: Introduction-Decision making with if statement-Simple if statement-The if..else Statement-Nesting of if...else statements-The switch statement-The Conditional Operator (?:Operator)- Decision Making and Looping: While, Do, For Statement, Jump in Loops, Return Statement.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Classes, Objects and Methods: Defining a Class–Fields and Methods Declaration - Creating Objects – Accessing Class Members–Constructors–Method Overloading – Static Members – Nesting of Methods – Inheritance: Extending a Class – Overriding Methods – Abstract Methods and Classes– Arrays, Strings and Vectors: Creating Arrays – One and two Dimensional Arrays-Strings. Interfaces: Multiple Inheritance: Introduction-Defining Interfaces-Extending Interfaces-Implementation Interfaces-Accessing Interfaces Variables	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Packages: Introduction - Java Packages - Using System Packages-Naming conventions-Creating packages-Accessing a package - Using a Package - Adding a class to a package - Multithreaded Programming: Creating Threads – Extending the Thread Class – Thread- Life Cycle of Thread-Using Thread Method-Thread Priority –Synchronization– Managing Errors and Exceptions: Introduction-Types of Errors-Exceptions-Syntax of Exception Handling code-	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	The Collections Framework: The Collection Interfaces: Collection Interface, List Interface, Set Interface, SortedSet Interface– The Collection Classes: ArrayList Class, HashSet Class, TreeSet Class – Stack class	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination) History of Java - Installing and Configuring Java- Comment Line Arguments – Enumerated Types - Finalizer Methods. Managing Input/ Output Files in Java: Stream Classes – Byte Stream Classes– Character Stream Classes – Creation of Files – Reading/Writing Characters–Reading/Writing bytes.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

E.Balagurusamy (2019). *Programming with Java*. Mc Graw Hill Education(India) Pvt. Ltd. – Edition - 6

Reference Book

Herbert Schildt. (2019). *The Complete Reference JAVA*. (11th Edition). McGraw Hill Education (India) Pvt.Ltd.

Web References

1. <https://www.slideshare.net/sreedharchowdam1/java-notes-56309340>
2. <https://sites.google.com/a/rcoe.co.in/computer-programming-ii-java/dashboard/java-notes>
3. <https://slideplayer.com/slide/13598881/>

Pedagogy

Chalk and Talk, Power Point Presentation, Demonstration, e-Content

Course Designer

Dr.S. Latha

Semester II	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
23UCG2CC2P	JAVA PROGRAMMING (P)	CORE	2	2

Course Objective

- To demonstrate the basic programming components in Java
- To learn how to apply the Object Oriented concepts in Java to develop applications
- To design and develop GUI applications

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Demonstrate and implement the fundamental OOPs concept	K1,K2
CO2	Apply the reusability and develop the Java program	K3
CO3	Analyze the working of exception handling and threads	K4
CO4	Illustrate of the Collection concept to design Java program	K4
CO5	Design the Java program using Collection classes and interfaces	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	2	3	2	3	2	3	2
CO2	3	2	2	3	3	2	3	2	3	3
CO3	2	3	3	3	3	2	3	2	3	3
CO4	2	3	3	3	3	2	3	2	3	2
CO5	2	3	3	3	2	2	3	2	3	3

“1”- Slight (Low) Correlation

“3” - Substantial (High) Correlation

“2”- Moderate (Medium) Correlation

“-” - Indicates there is no Correlation

List of Exercises

1. Write a Java Program to overload the constructors and instantiate its object.
2. Write a Java program to practice using String class and its methods.
3. Write a Java Program to implement inheritance and demonstrate use of method overriding.
4. Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods.
5. Write a program to demonstrate use of implementing and extending interfaces.
6. Write a Java program to implement the concept of creating packages and importing classes from user defined package.
7. Write a program to implement the concept of Thread Class.
8. Write a program to implement the concept of Exception Handling.
9. Collection Interface
10. Collection Class

Web References

1. <https://www.programiz.com/java-programming>
2. <https://code-exercises.com/>
3. <https://practity.com/765-2/>

Pedagogy

Power Point Presentation and Demonstration.

Course Designer

Dr. S. Latha



Cauvery College for Women (Autonomous), Trichy

PG & Research Department of Computer Science

B.Sc Computer Science with Cognitive Systems

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2022 - 2023 and onwards)

Semester - III

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. /week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
III	I	Language Course-III(LC)	Kaappiyamum Naadakamum	22ULT3	5	3	3	25	75	100
			Hindi Literature & Grammar –III	22ULH3						
			Prose, Textual Grammar And Vakyarachana	22ULS3						
			Intermediate French-I	22ULF3						
	II	English Language Course-III (ELC)	Learning Grammar Through Literature-I	22UE3	6	3	3	25	75	100
	III	Core Course– V(CC)	Java Programming	22UCG3CC5	5	5	3	25	75	100
		Core Practical– III(CP)	Java Programming(P)	22UCG3CC3P	2	2	3	40	60	100
		Core Course-VI(CC)	Infrastructure Management	22UCG3CC6	6	6	3	25	75	100
		Second Allied Course-I(AC)	Digital Computer Fundamentals	22UCG3AC4	4	3	3	25	75	100
	IV	Generic Elective Course-I (GEC)	Office Automation (P)	22UCG3GEC1P	2	2	3	40	60	100
			Basic Tamil– I	22ULC3BT1				25	75	
			Special Tamil – I	22ULC3ST1						
Total					30	24				700

Semester III	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UCG3CC6	INFRASTRUCTURE MANAGEMENT	CORE	6	6

Course Objective

- To describe devices, drivers, configuration task
- To acquire the process of planning and configuring technique
- To monitor and create reports

Course Outcome with Cognitive Level

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Define the key concepts of Infrastructure Management	K1
CO2	Outline the functions of Configuration manager	K2
CO3	Utilize the knowledge to deploy client and server	K3
CO4	Analyze the performance of OS and able to monitor the infrastructure	K4
CO5	Categorize and explain the functions of SCCM and SCOM	K4,K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	2	2	2	3	2
CO2	3	2	2	3	2	2	3	2	3	2
CO3	3	2	3	3	3	3	3	2	3	2
CO4	2	3	2	3	2	2	3	2	3	3
CO5	3	2	2	3	3	3	3	2	3	2

“1”-Slight (Low)Correlation
“3” –Substantial (High)Correlation

“2”-Moderate(Medium)Correlation
“-” - Indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Windows 10 Client OS Introducing Windows 10, Overview of Deploying Windows 10, Configure Devices and Drivers, Perform Post installation Configuration Tasks, Managing Apps in Windows.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Introduction to SCCM System Center Configuration Manager Overview, SCCM Features and Capabilities, SCCM Setup & Installation, Configuration Manager Basics, Deploying SCCM Client, User and Device Collections in SCCM.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Managing Systems with SCCM Application Management using SCCM, Operating System Deployment using SCCM, Endpoint Protection using SCCM, Troubleshooting SCCM Server, Troubleshooting SCCM Clients, Creating Reports using SCCM Reports.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Introduction to SCOM System Center Operations Manager Overview, SCOM Features and Capabilities, SCOM Setup & Installation, Operations Manager Basics, Deploying SCOM Clients, Management Packs in SCOM.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Monitoring Systems with SCOM Managing & Administering SCOM Environment, Managing Alerts using SCOM, Creating Custom Management Packs and Alerts, Troubleshooting SCOM Server, Troubleshooting SCOM Clients, Creating Reports using SCOM Reporting.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Managing and creating global conditions configuration manager queries: Introducing the queries node - Creating queries- ConfigMgr query builder - Criterion types, Operators and values - Writing Advanced queries.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Suggested Readings

1. Woody Leonhard, Ciprian Rusen. (2021). *Windows 10 All-in-One For Dummies*
2. Kerrie Meyler, Gerry Hampson, Saud Al-Mishari, Greg Ramsey, Kenneth van Surksun, Michael Gottlieb Wiles. (2018).
System Center Configuration Manager Current Branch Unleashed. (1st Edition). Sams Publishing.
3. Kevin Greene. (2016). *Getting Started with Microsoft System Center Operations Manager*

Web References

- **Windows 10**
 - [Windows 10 Tutorial - 3.5 Hour Windows Guide + Windows 10 Tips](#)
 - [Windows 10 for Dummies, Newbies, and other Fine Beginners](#)
- **System Center Configuration Manager (SCCM)**
 - [System Center Configuration Manager Overview](#)
 - [SCCM Features and Capabilities](#)
 - [SCCM Setup & Installation](#)
 - [Configuration Manager Basics](#)
 - Deploying SCCM Client
 - [Configuration Manager client application](#)
 - [Client installation methods in Configuration Manager](#)
 - User and Device Collections in SCCM
 - [Introduction to collections in Configuration Manager](#)
 - [Prerequisites for collections in Configuration Manager](#)
 - [How to create collections in Configuration Manager](#)
 - [How to manage collections in Configuration Manager](#)
 - Application Management using SCCM
 - [Create applications in Configuration Manager](#)
 - [Deploy applications with Configuration Manager](#)
 - [Manage Applications](#)
 - [Monitor applications from the Configuration Manager console](#)
 - Operating System Deployment using SCCM
 - [Introduction to operating system deployment in Configuration Manager](#)
 - [Infrastructure requirements for OS deployment in Configuration Manager](#)
 - [Scenarios to deploy enterprise operating systems with Configuration Manager](#)
 - Endpoint Protection using SCCM
 - [Endpoint Protection Overview](#)
 - [Endpoint Protection Client](#)
 - [Example Scenario: Use Endpoint Protection to protect computers from malware](#)
 - [Troubleshooting SCCM Server](#)
 - [Troubleshooting SCCM Clients](#)
 - Creating Reports using SCCM Reports
 - [Operations and maintenance for reporting in Configuration Manager](#)
 - [List of reports in Configuration Manager](#)

- **System Center Operations Manager (SCOM)**
 - System Center Operations Manager Overview
 - Operations Manager key concepts
 - SCOM Features and Capabilities
 - SCOM Setup & Installation
 - Deploying System Center Operations Manager
 - Single-server deployment of Operations Manager
 - Operations Manager Basics
 - Management server
 - Web console server
 - Reporting server
 - Operational database
 - Data warehouse database
 - Deploying SCOM Clients
 - Install Agent on Windows Using the Discovery Wizard
 - Management Packs in SCOM
 - What is in an Operations Manager management pack?
 - Management packs installed with Operations Manager
 - Managing & Administering SCOM Environment
 - How to connect to the Operations and Web Console
 - Finding data and objects in the Operations Manager consoles
 - Using the Operations Manager Operations console
 - Using the Administration workspace in Operations Manager
 - Managing Alerts using SCOM
 - How an alert is produced?
 - Viewing active alerts and details
 - How to suspend monitoring temporarily by using maintenance mode
 - Creating Custom Management Packs and Alerts
 - Management pack templates
 - Create management pack templates
 - Troubleshooting SCOM Server
 - Troubleshooting SCOM Clients
 - Creating Reports using SCOM Reporting
 - Using the Reporting Workspace in Operations Manager
 - How to create reports in Operations Manager
 - How to run, save, and export a report

Pedagogy

Chalk and Talk, Power point Presentation, Assignment, Seminar, e-content

Course Designer

TCS

ALLIED COURSE SYLLABUS

2022-2023 and Onwards

SECOND ALLIED COURSE III (AC)
INTERNET OF THINGS
2022-2023 Onwards

Semester IV	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UMA4AC6	INTERNET OF THINGS	SECOND ALLIED COURSE III(AC)	4	3

Course Objective

- **Able** to understand building blocks of Internet of Things and characteristics.
- **Apply** the concept of Internet of Things in the real-world scenario.
- **Understand** the application areas of Internet of things.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
	On the successful completion of the course, students will be able to	
CO1	Understand building blocks of Internet of Things and its characteristics.	K1, K2
CO2	Analyze basic protocols in wireless sensor network.	K3
CO3	Categorize different sensor technologies for sensing real world entities and identify the applications.	K4
CO4	Demonstrate the ability to transmit data wirelessly between different devices.	K5
CO5	Design IoT applications in different domains and able to analyze their performance.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	2	3	3	2	3	3	3	3	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Internet of Things: Introduction – Overview of Internet of Things (IoT) - Characteristics of IoT - IOT Applications - Working and Implementation of IoT - Components of an IoT System - IoT Architecture and Levels - IoT Ecosystem - Value chain and global value chain - Types of Networks – IoT Technologies and Protocols – Technologies used in IoT.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Introduction to Internet of Things: Communication Protocols – IOT Enabling Technologies – Building blocks of IoT – The logical and Physical design of IoT – Functional blocks of IoT – IoT design Methodology – Communication models.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Things and Connections: Introduction to control systems – Working of controlled systems – Feedback systems – Connectivity models – OSI model – TCP/IP model – Types of modes – Wired and Wireless Methodology – Transmission media – Guided media – Unguided media.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Sensors, Actuators and Microcontrollers: Introduction – Sensor – Classification of Sensors – Types of Sensors – Criteria to choose a Sensor – Actuators – Classification of Actuators – Microcontroller – Classification of Microcontrollers – Components of Microcontroller – Types of Microcontrollers – Application of Microcontroller – Embedded System – Real time Embedded system.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Building IoT Applications: Introduction to Arduino – Types of Arduino Boards – Introduction to Arduino IDE – Parts of Arduino IDE – Development Cycle – Writing/Editing Code in Sketch – Compiling – Debugging – Uploading and Running a File – Role of Serial Monitor – Role of Serial Plotter – LED Programming – Open Your First Sketch.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self -Study for Enrichment: (Not included for End Semester Examination) Development tools used in IoT - The process flow of IoT- Embedded 'C' Language Basics – Variables and Identifiers – Keywords – Built –in Data Types – Variable Scope.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. Prof. Satish Jain & Shashi Singh (2020). *IoT and its Applications*, BPB Publications, India.

Chapters and Sections

UNIT-I	Chapter 1	:	Sections 1.1 – 1.12
UNIT-II	Chapter 1	:	Sections 1.13 – 1.19
UNIT-III	Chapter 2	:	Sections 2.1 – 2.11
UNIT-IV	Chapter 3	:	Sections 3.1 – 3.14
UNIT-V	Chapter 4	:	Sections 4.1 – 4.12

Reference Books

1. Arshdeep Bahga and Vijay Madisetti (2014). *Internet of Things A Hands-on Approach*, Universities Press.
2. Raj Kamal (2017). *Internet of Things Architecture and Design Principles*, Mc Graw Hill Education (India) Private Limited.
3. Preston Gralla (2012). *How the Internet Works*, Pearson Education.

Web References

1. <https://iotbyhvm.ooo/physical-design-of-iot/>
2. <https://www.javatpoint.com/iot-internet-of-things>
3. <https://www.oracle.com/in/internet-of-things/what-is-iot/>
4. <https://www.edureka.co/blog/iot-applications/>
5. <https://www.rfpage.com/applications-of-internet-of-things-iot/>

Pedagogy

Chalk and Talk, Power point presentation, Group Discussion, Seminar, Assignment and Quiz.

Course Designer

Ms. R. Soundaria

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE



M. Sc. COMPUTER SCIENCE

SYLLABUS

2023-2024 and Onwards

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course– I (CC)	Analysis & Design of Algorithms	23PCS1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Object Oriented Analysis and Design & C++	23PCS1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Python Programming	23PCS1CC3	6	5	3	25	75	100
	Core Practical - I (CP)	Algorithm and OOPS (P)	23PCS1CC1P	6	5	3	40	60	100
	Discipline Specific Elective Course-I (DSE)	A. Advanced Software Engineering	23PCS1DSE1A	6	3	3	25	75	100
		B. Advanced Computer Architecture	23PCS1DSE1B						
		C. Advanced Database Systems	23PCS1DSE1C						
	Total				30	23	-	-	-
15 Days INTERNSHIP during Semester Holidays									

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23PCS1CC1	ANALYSIS & DESIGN OF ALGORITHMS	CORE	6	5

Course Objective

- To learn the Elementary Data Structures and algorithms
- To understand the basics of an algorithm, their analysis and design
- To inculcate the knowledge of Basic Traversal and Search Techniques, Greedy method, Divide and Conquer method, Dynamic programming and Backtracking

Prerequisite

Basic concepts of data structures and algorithms

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Get knowledge about algorithms and determine their time complexity	K1
CO2	Demonstrate specific search and sort algorithms using divide and conquer technique	K2
CO3	Apply different methods to analyze the algorithm performance	K3
CO4	Compare the concept of various algorithm technique	K4
CO5	Explore the algorithm technique on Real time applications	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	1	3	2
CO2	3	3	3	2	3	3	3	2	3	3
CO3	3	2	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	2	1	2
CO5	3	3	3	3	3	3	3	2	3	3

“1”–Slight (Low) Correlation

“3”–Substantial (High) Correlation

“2”–Moderate (Medium) Correlation

“-”–indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: - Algorithm Definition and Specification – Space complexity – Time Complexity –Asymptotic Notation. Elementary Data Structures: Stacks and Queues – Binary Trees - Binary Search Trees - Heaps – Heap sort - Graphs.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Basic Traversal And Search Techniques: Techniques for Binary Trees – Techniques for Graphs. Divide and Conquer: General Method – Binary Search – Merge Sort– Quick Sort.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	The Greedy Method: General Method – Knapsack Problem – Minimum Cost Spanning Trees: Prim's Algorithm – Kruskal Algorithm – Optimal storage on Tapes – Single Source Shortest Paths.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Dynamic Programming: General Method – Multistage Graphs – All Pair Shortest Path – Optimal Binary Search Trees – 0/1 Knapsack – Traveling Sales person Problem –Flow Shop Scheduling.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Back tracking: General Method – 8-Queens Problem – Sum of Subsets – Graph Coloring– Hamiltonian Cycles. Branch And Bound:- The Method–Traveling Sales person.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment: (Not included for End Semester Examination) NP Hard and NP Complete Problems: Basic Concept – COOK's theorem – NP Hard Graph Problems – NP Hard Code Generation.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekan.(2017). *Fundamentals of Computer Algorithms*. 2ndEdition, University Press.

Reference Books

1. Alfred V. Aho, John E Hopcraft, Jefffrey D. Ullman.(2004). *Data Structures and Algorithms*. Pearson Education.
2. Goodrich. *Data Structures & Algorithms in Java*.3rdEdition, Wiley.
3. Skiena. (2008).*The Algorithm Design Manual*. 2ndEdition, Springer.
4. Anany Levith.(2003). *Introduction to the Design and Analysis of algorithm*. Pearson Education Asia.
5. Robert Sedgewick, Phillipe Flajolet.(1996).*An Introduction to the Analysis of Algorithms*. Addison-Wesley Publishing Company.

WebReferences

1. <https://nptel.ac.in/courses/106/106/106106131/>
2. https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm
3. <https://www.javatpoint.com/daa-tutorial>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar.

Course Designer

Ms. P. Muthulakshmi

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23PCS1CC2	OBJECT ORIENTED ANALYSIS AND DESIGN & C++	CORE	6	5

Course Objective

- To Present the object model, classes and objects, object orientation, machine view and model management view
- To learn the basic functions, principles and concepts of object oriented analysis and design
- To understand C++ language with respect to Object Oriented Analysis and Design

Prerequisites

Basics of Programming and Object Oriented Programming Concepts

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand the concept of Object Oriented development and modeling techniques	K1, K2
CO2	Gain knowledge about the various steps performed during object design	K2, K3
CO3	Abstract object-based views for generic software systems	K3
CO4	Link OOAD with C++ language	K4,K5
CO5	Apply the basic concepts of OOPs and familiarize to write C++ program	K5, K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	2	3	3	2	3	3	2	3	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	The Object Model: The Evolution of the Object Model – Elements of the Object Model – Applying the Object Model. Classes and Objects: The Nature of an Object – Relationships among Objects- The Nature of Class – Relationship among Classes – The Interplay of Classes and Objects.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Introduction to C++-Input and Output in C++- C++ Declarations - Control Structures.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Functions in C++ - Classes and Objects in C++– Constructors and Destructors–Operator Overloading and Type Conversion.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Inheritance – Pointers and Arrays-C++ And Memory: the new and Delete operators – Polymorphism and Virtual Functions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Applications with Files–Exception Handling – Working with Strings - Overview of Standard Template Library (STL).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-Study for Enrichment: (Not included for End Semester Examinations) Classification: The Importance of Proper Classification –Identifying Classes and Objects – Key Abstractions and Mechanisms. Notation: The Unified Modeling Language – Component Diagrams-Deployment Diagrams-Use Case Diagrams-Activity Diagrams-Class Diagrams-Object Diagrams.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Grady Booch, Robert A. Maksimchuk, Michael W. Engle, BobbiJ.Young, Jim Conallen, Kelli A.Houston.(2014). *Object Oriented Analysis and Design with Applications*.3rd Edition, Pearson Education.(Unit: I)
2. Ashok N.Kamthane.(2009). *Object-Oriented Programming with ANSI & TurboC++*, 7th Impression, Pearson Education Limited.(Unit:II - V)

Reference Books

1. Balagurusamy (2003), *Object Oriented Programming with C++*, Second Edition, TMH.
2. Yashwant Kanetkar .(2019). *Let Us C++* , Third Edition, BPB.

Web References

1. https://onlinecourses.nptel.ac.in/noc19_cs48/preview
2. <https://nptel.ac.in/noc/courses/noc16/SEM2/noc16-cs19/>
3. https://www.tutorialspoint.com/object_oriented_analysis_design/ooad_object_oriented_analysis.htm

Pedagogy

Chalk and Talk, PPT , Discussion, Assignment, Quiz, Seminar

Course Designer

Ms. K. Pradeepa

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23PCS1CC3	PYTHON PROGRAMMING	CORE	6	5

Course Objective

- To learn the Syntax and Semantics of Python Programming Language
- To write Python functions to facilitate code reuse and manipulate Strings
- To Understand different Data Structures of Python
- To Illustrate the process of Structuring the data using Lists, Tuples and Dictionaries

Pre requisites

Basic Knowledge in Programming Language

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall and understand the basic concepts of Python Programming	K1, K2
CO2	Understand the fundamental principles of Classes and Objects	K2
CO3	Solve real world problems by applying Object Oriented Skills	K3
CO4	Analyze the concepts of Python for developing Web applications	K4
CO5	Develop and evaluate programs for Client Server Networking applications	K5, K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	3	3	2	3
CO2	3	2	2	2	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	2	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” –indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	A Taste of Py: Installing Python – Running Python. Py Ingredients: Numbers, Strings, and Variables. Py Filling: Lists, Tuples, Dictionaries and Sets.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Py Crust: Code Structures: Compare with if, elif and else – Repeat with while – Iterate with for – Comprehensions – Functions – Generators – Decorators – Namespaces and Scope – Handle Errors with try and except – Make your own Exceptions.	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6
III	Py Boxes: Modules, Packages, and Programs: Standalone Programs – Command-Line Arguments – Modules and the import Statement – Packages - The Python Standard Library. Oh Oh: Objects and Classes: Objects - Define a Class with class – Inheritance – Override a Method – Add a Method – Get Help from Your Parent with super – In self Defense –Get and Set Attribute Values with Properties –Name Mangling for Privacy – Method Types – Duck Typing – Special Methods – Aggregation and Composition.	20	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6
IV	Mangle Data Like a Pro: Text Strings – Binary Data. Data Has to Go Somewhere: File Input/Output – Structured Text Files – Structured Binary Files - Relational Databases – NoSQL Data Stores. The Web, Untangled: Web Clients – Web Servers – Web Services and Automation.	17	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6
V	Systems: Files – Directories – Programs and Processes – Calendars and Clocks. Concurrency and Networks: Concurrency: Queues – Processes – Threads –Green Threads and gevent – twisted – Redis-Networks: Patterns – The Publish - Subscribe Model – TCP/IP – Sockets – ZeroMQ – Internet Services – Web Services and APIs – Remote Processing – Big Fat Data and Map Reduce – Working in the Clouds.	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	Self-Study for Enrichment: (Not included for End Semester Examinations) Full-Text Databases – PyCharm-Case Study: Data Analysis and Visualization using Python- Web Development Using Python-Scientific Computing Using Python.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book

1. Bill Lubanovic. (2016). *Introducing Python*. 1st Edition, Third Release, O'Reilly

Reference Books

1. MarkLutz. (2013). *Learning Python*. 5th Edition, O'Reilly
2. David M. Beazley. (2009). *Python Essential Reference*. 4th Edition, Developer's Library.
3. Sheetal Taneja, Naveen Kumar. (2017). *Python Programming – A Modular Approach*, Pearson Publications

Web References

1. <https://www.programiz.com/python-programming/>
2. <https://www.tutorialspoint.com/python/index.htm>
3. https://onlinecourses.swayam2.ac.in/aic20_sp33/preview
4. https://www.w3schools.com/python/python_intro.asp
5. <https://www.javatpoint.com/python-tutorial>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Ms. R. Sangeetha

Semester: I	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23PCS1CC1P	ALGORITHM AND OOPS (P)	CORE	6	5

Course Objective

- To learn the applications of the data structures using various techniques
- To understand C++ language with respect to Object Oriented Analysis and Design (OOAD) concepts
- To build application of OOPS concepts

Prerequisites

Basic understanding of C++ Programming

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Identify and apply the suitable data structure for the given real world problem	K2, K3
CO2	Able to understand and implement OOPS concepts.	K2,K3
CO3	Apply the concepts of Stack, Queue, Tree, List using C++	K3
CO4	Analyze the concepts of sorting and searching algorithms using relevant data structures.	K4
CO5	Interpret and Solve problem involving graphs, trees and heaps	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	2	3	3	2	3	3	2	3	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” –indicates there is no Correlation.

Exercises

1. Write a program to solve the Tower of Hanoi using recursion.
2. Write a program to traverse through Binary Search Tree using traversals.
3. Write a program to perform various operations on Stack using Linked list.
4. Write a program to perform various operations in a circular queue.
5. Write a program to sort an array of elements using Quick sort.
6. Write a program to solve the number of elements in ascending order using Heap sort.
7. Write a program to solve the knapsack problem using Greedy method
8. Write a program to search an element in a tree using Divide & Conquer strategy.
9. Write a program to place the 8 queens on an 8 x 8 matrix so that no two queens Attack.
10. Write a C++ program to perform Virtual Function
11. Write a C++ program to perform Parameterized Constructor
12. Write a C++ program to perform Friend Function
13. Write a C++ program to perform Function Overloading
14. Write a C++ program to perform Single Inheritance
15. Write a C++ program to perform Employee Details using files.

Web References

1. https://onlinecourses.nptel.ac.in/noc19_cs48/preview
2. https://www.tutorialspoint.com/object_oriented_analysis_design/ooad_object_oriented_analysis.htm
3. <https://www.geeksforgeeks.org/c-plus-plus/?ref=shm>
4. <https://www.tutorialspoint.com/cplusplus-program-to-implement-stack-using-linked-list>
5. <https://webeduclick.com/cpp-program-tower-of-hanoi-using-recursion/>

Pedagogy

Power Point Presentation, Live Demonstration

Course Designer

Ms. S.Saranya

Semester: I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23PCS1DSE1A	ADVANCED SOFTWARE ENGINEERING	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To learn the concepts of Software Engineering
- To provide the idea of decomposing the given problem into Analysis, Design, Testing and Maintenance phases
- To inculcate knowledge on Software Project Management, Software Design & Testing

Prerequisites

Basics of Software Engineering & Software Project Management

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand about Software Engineering process	K1, K2
CO2	Make use of Software Project Management Skills, Design and Quality Management	K3
CO3	Analyze on Software Requirements and Specification	K4
CO4	Analyze and Compare Software Testing, Maintenance and Software Re-Engineering	K4, K5
CO5	Design and conduct various types and levels of software quality or a software project	K5, K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3	3	3	2	2	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: The Problem Domain – Software Engineering Challenges - Software Engineering Approach. Software Processes: Software Process – Characteristics of a Software Process – Software Development Process Models – Other software processes.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Requirements Analysis and Specification: Requirements Gathering and Analysis- Software Requirements Specification (SRS) - Formal System Specification – Axiomatic Specification – Algebraic Specification. Software Quality Management: Software Quality-Software Quality Management System-ISO 9000 - SEI Capability Maturity Model.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Software Project Management: Responsibilities of a Software Project Manager – Project Planning – Metrics for Project Size Estimation – Project Estimation Techniques – Empirical Estimation Techniques – COCOMO – Halstead’s Software Science – Staffing Level Estimation – Scheduling– Organization and Team Structures – Staffing – Risk Management – Software Configuration Management.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Software Design: Outcome of the Design Process – Characteristics of a good software design – Cohesion and Coupling -Layered Arrangement of Modules- Function Oriented Design – Object Oriented Design. Function Oriented SoftwareDesign: Structured Analysis-Structured Design-Detailed Design-Design Review.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Software Testing: Basic concepts and Terminologies – Design Test Cases: Functional testing– Structural testing – Levels of testing: Unit testing, Integration Testing and System Testing – Debugging–Program Analysis tools-Some General Issues Associated with Testing: Regression testing. Software Maintenance: Characteristics of Software Maintenance – Software Reverse Engineering – Software Maintenance Process Models: Software Re-engineering.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-Study for Enrichment: (Not included for End SemesterExaminations) Requirement engineering -Strategy of Design-IEEE Recommended Practice for Software Design Descriptions - Reliability Estimation. Case Study: Student Result Management System.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Pankaj Jalote, (2005). *An Integrated Approach to Software Engineering*, 3rd Edition, Springer Science + Business Media. **(Unit: I)**
2. Rajib Mall,(2018).*Fundamentals of Software Engineering*,5th Edition, PHI Learning Private Limited. **(Unit: II - V)**

Reference Books

1. K.K.Aggarwal and Yogesh Singh,(2005). *Software Engineering*. Revised 2nd Edition, New Age International Publishers.
2. R.S.Pressman(2010).*A Practitioner's Approach-Software Engineering*. McGraw-Hill Higher Education.
3. Carlo Ghezzi.M, Jazayeri, D.Mandrioli (2010).*Fundamentals of Software Engineering*, PHI Publication

Web References

1. <https://www.javatpoint.com/software-engineering-tutorial>
2. https://onlinecourses.swayam2.ac.in/cec20_cs07/preview
3. https://onlinecourses.nptel.ac.in/noc19_cs69/preview
4. https://www.google.co.in/books/edition/FUNDAMENTALS_OF_SOFTWARE_ENGINEERING_FIF/-
5. https://www.google.co.in/books/edition/_/pJc3xKQfD-MC?hl=en&gbpv=1

Pedagogy

Chalk & Talk, PPT, Group Discussion, Seminar and Assignment

Course Designer

Dr.K.Reka

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23PCS1DSE1B	ADVANCED COMPUTER ARCHITECTURE	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To understand the micro-architectural design of processors
- To learn about the various techniques used to obtain performance improvement and power savings in current processors
- To gain knowledge in distributed and Parallel Computing Architecture

Prerequisites

Basic Knowledge about Microprocessor

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO 1	Remember and Understand the computer architecture	K1, K2
CO 2	Interpret and Experiment with different pipelined processor	K2, K3, K5
CO 3	Organize and Analyze the architectural features of advanced processors	K3, K4
CO 4	Examine and Evaluate the cache and memory related issues in multiprocessors	K4, K5
CO 5	Assess the historical and current developments in computer architecture and adopt to the needs	K5, K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	3	3	3	3	3	3	3
CO 2	3	2	3	2	3	2	3	2	2	3
CO 3	2	3	2	3	2	3	3	3	3	3
CO 4	3	3	3	2	3	3	3	3	2	2
CO 5	2	3	3	3	2	2	3	3	3	3

“1”–Slight (Low) Correlation
“3”–Substantial (High) Correlation

“2”–Moderate (Medium) Correlation
“-”indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamentals of Quantitative Design and Analysis: Classes of Computers - Defining Computer Architecture-Trends in Technology, Power, Energy and Cost – Dependability- Measuring, Reporting, and summarizing Performance - Quantitative Principles of Computer Design	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Instruction-Level Parallelism: Concepts and Challenges – Basic Compiler Techniques for Exposing ILP – Reducing Branch Costs with Advanced Branch Prediction - Overcoming Data Hazards with Dynamic Scheduling-Hardware-Based Speculation - Exploiting ILP Using Dynamic Scheduling, Multiple Issue, and Speculation	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Data-Level Parallelism in Vector SIMD and GPU Architectures: Vector Architecture - SIMD Instruction Set Extensions for Multimedia -Graphics Processing Units- Detecting and Enhancing Loop-Level Parallelism	19	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Thread-Level Parallelism: Centralized Shared-Memory Architectures-Performance of Symmetric Shared-Memorymultiprocessor-Distributed Shared-Memory and Directory-Based Coherence-Synchronization-Models of Memory Consistency	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Warehouse-scale Computers to Exploit Request Level and Data-Level Parallelism: Programming Models and Workloads for Warehouse- Computer Architecture of Warehouse-Scale Computers – The Efficiency and cost of Warehouse-Scale Computers	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Historical Perspectives Quantitative Design and Analysis: Limitations of Instruction-Level Parallelism and Its Exploitation-Fallacies and pitfalls of Data-Level Parallelism in Vector-Cross Cutting Issues in Thread - Level Parallelism-Using Energy Efficiency inside the server.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book

1. John L Hennessey, David A Patterson (2019). *Computer Architecture A Quantitative Approach*. Sixth Edition, Morgan Kaufmann Elsevier.

Reference Books

1. KaiHwang, FayeBrigg(2000). *Computer Architecture And Parallel Processing*. International Edition, McGraw-Hill.
2. SimaD, FountainT, KacsukP(2000). *Advanced Computer Architectures: A Design Space Approach*. Addison Wesley.

Web References

1. www.cs.iit.edu.in/
2. <https://passlab.github.io/CSE565/note>

Pedagogy

Chalk and talk & Seminar

Course Designer

Ms. A. Jabeen

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
23PCS1DSE1C	ADVANCED DATABASE SYSTEMS	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To inculcate knowledge in Transaction Management with ACID properties
- To learn about advanced concepts of Database Management System
- To gain Knowledge in Information retrieval using XML and Internet Databases

Prerequisites

Basic knowledge about Relational Database Management Systems

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Remember and Understand the concepts of databases	K1, K2
CO2	Demonstrate and make use of different kinds of databases	K2, K3
CO3	Identify and analyze databases for real life applications	K3, K4
CO4	Compare and evaluate the performance of databases based on its transaction and concurrency control feature	K4, K5
CO5	Interpret and develop parallel, distributed, object oriented And advanced databases for handling real time data	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	2	3	2	3	3	3	2	2	3
CO3	2	3	2	3	2	3	3	3	3	3
CO4	3	3	3	2	3	2	3	3	2	2
CO5	2	3	3	3	2	3	3	3	3	3

“1”–Slight (Low) Correlation
“3”–Substantial (High) Correlation

“2”–Moderate (Medium) Correlation
“-”indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Transactions Management: Transaction Concepts – A Simple Transaction Model - Transaction Atomicity and Durability – Transaction Isolation- Serializability Transaction Isolation and Atomicity. Concurrency Control: Lock based Protocols – Deadlock Handling – Multiple Granularity – Timestamp - Based Protocols – Validation - Based Protocols.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Parallel Databases: I/O Parallelism – Interquery Parallelism - Intraquery Parallelism - Intraoperation Parallelism-Interoperation Parallelism- Query Optimization - Design of Parallel Systems - Parallelism on Multicore Processors	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Distributed Databases: Homogeneous and Heterogeneous Databases – Distributed Data Storage - Distributed Transactions - Commit Protocol – Concurrency Control in Distributed Databases-Availability - Distributed Query Processing-Heterogeneous Distributed Databases-Cloud Based Databases - Directory Systems	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Object Based Databases: Complex Data Types – Structured types and Inheritance in SQL – Table Inheritance - Array and Multiset Types in SQL – ObjectIdentity and Reference Types in SQL - Implementing O-R features–Object Relational Mapping - Object-Oriented versus Object-Relational.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	XML: Extensible Markup Language: Structured, Semi Structured and Unstructured Data – XML Hierarchical (Tree) Data Model – XML Documents, DTD, XML Schema - Storing and Extracting XML documents fromDatabases–XMLLanguages - Extracting XML documents from RelationalDatabases.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Case Studies: SQL - MYSQL - Oracle - PostgreSQL- NOSQL -DynamoDB- MongoDB .	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Abraham Silberschatz., Henry F. Korth. S. Sudarshan (2013). *Database System Concepts*. 6th Edition, McGraw Hill. **(Unit I - IV)**
2. Ramez Elmasri, Shamkant. B.Navathe (2015). *Fundamentals of Database Systems*. 6th Edition, Pearson Education. **(Unit V)**

Reference Books

1. Thomas Connolly, Carolyn Begg. (2015). *Database Systems, A Practical Approach to Design, Implementation and Management*. 6th Edition, Pearson Education.
2. Raghu Ramakrishnan, Johannes Gehrke. (2007). *Database Management System*. 3rd Edition, McGraw Hill Higher Education.

Web References

1. <https://www.exploredatabase.com/p/advanced-database-concepts>
2. <https://www.wideskills.com/introduction-to-database>

Pedagogy

Chalk and talk, Lecture, Discussion, Quiz, Demonstration, and PPT

Course Designer

Ms.R. Sridevi

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified TIRUCHIRAPPALLI

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE



M. Sc. COMPUTER SCIENCE SYLLABUS

2023-2024 and Onwards



Cauvery College for Women (Autonomous), Trichy-18

PG & Research Department of Computer Science

M.Sc. Computer Science

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK(CBCS-LOCF)

(For the Candidates admitted from the Academic year 2023-2024 onwards)

Semester II

Semester	Course	Course Title	Course Code	Inst.Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
II	CoreCourse– IV(CC)	Data Mining and Warehousing	22PCS2CC4	6	5	3	25	75	100
	Core Course– V(CC)	Compiler Design	23PCS2CC5	6	5	3	25	75	100
	Core Choice Course– I(CCC)	A. Mobile Computing	22PCS2CCC1A	6	4	3	25	75	100
		B. Wireless Sensor Networks	22PCS2CCC1B						
		C. MANET	22PCS2CCC1C						
	CorePractical-II(CP)	Data Mining (P)	22PCS2CC2P	6	5	3	40	60	100
	Discipline Specific Elective Course-II(DSE)	A.Cryptographyand Network Security	22PCS2DSE2A	6	3	3	25	75	100
		B. Block chain and Cryptocurrencies	22PCS2DSE2B						
		C. Ethical Hacking	22PCS2DSE2C						
	Internship	Internship	22PCS2INT	-	2	-	25	75	100
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total				30	24	-	-	-	600

SEMESTER II

Semester: II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCS3CC6 / 23PCS2CC5	COMPILER DESIGN	CORE	6	5

Course Objective

- To enrich the knowledge in various development phases of compiler and its uses
- To learn Code optimization techniques, machine code generation and use of symbol table
- To identify the similarities and differences among various parsing techniques and grammar transformation techniques

Prerequisites

Basic Knowledge in Programming Languages, Data Structures and Discrete Mathematics

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand the structure of compiler, applications of finite automata, regular expressions, Grammar and identify the significance of different phases of the compiler.	K1, K2
CO2	Demonstrate the construction of finite automaton, various parsing, intermediate, target code generation and code optimization techniques.	K2
CO3	Construct the finite automaton, various parsing tables and develop intermediate and target code by using storage Allocation strategies.	K3, K4
CO4	Analyze and explain the relationship among the phases of compiler, various parsing and code optimization techniques	K4, K5
CO5	Assess and Recommend tools, methods, and techniques to build compiler	K4, K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	2	3	3	3	3	2
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	2	3	3	3	3	2

“1”– Slight (Low) Correlation

“3”– Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Compiler– The Structure of a Compiler – Lexical Analysis: The Role of the Lexical Analyzer – Specification of Tokens–Finite Automata- Nondeterministic Finite Automata-Deterministic Finite Automata- From Regular Expressions to Automata-Conversion of an NFA to a DFA-Construction of an NFA from Regular Expression	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Syntax Analysis: The Role of the Parser-Context Free Grammars-Verifying the language generated by a grammar-Context Free Grammars versus Regular Expressions-Writing a Grammar-Eliminating ambiguity -Elimination of Left Recursion-Left Factoring – Top-Down Parsing-Recursive Descent Parsing – Nonrecursive Predictive Parsing- Bottom-Up Parsing- Shift-Reduce Parsing	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	LR Parsers- The LR-Parsing algorithm-Constructing SLR Parsing tables-Canonical LR(1) Parsing tables-Constructing LALR Parsing tables. Syntax-Directed Translation: Inherited and Synthesized Attributes – Dependency Graphs – S-Attributed Definitions – L-Attributed Definitions – Construction of syntax trees- Syntax Directed Translations Schemes	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Intermediate-Code Generation: Variants of Syntax trees – Three Address code – Types and Declarations - Translation of Expressions – Type Checking - Control Flow – Back patching - Switch Statements – Intermediate Code for Procedures.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Code Generation: Issues in the design of a Code Generator - Basic Blocks and Flow graphs– Optimization of Basic Blocks- The DAG Representation of Basic Blocks - Peephole Optimization	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Compiler Construction tools -Input buffering- Recognition of tokens- Symbol Tables - Lexical analyzer Generator Lex-Parser Generator YACC. Error recovery in Parsing – Run time Environments- Storage organization- The target machine - A simple code generator.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. Alfred V. Aho, Monica S.Lam, Ravi Sethi and Jeffrey D. Ullman,(2013). “*Compilers - Principles, Techniques and Tools*”, Second Edition, Pearson Education.

Reference Books

1. Kennath C. Loudon,(2006). “*Compiler Construction: Principles and Practice*”, Vikas publishingHouse.
2. S. Godfrey Winstler, S.Aruna Devi, R.Sujatha,(2020). “*Compiler Design*”, Second Edition, Yesdee Publishers.
3. Raghavan V, (2017). “*Principles of Compiler Design*” Tata McGraw Hill Education Pvt. Ltd.

Web References

1. <https://www.geeksforgeeks.org/introduction-of-finite-automata/>
2. https://www.slideshare.net/appasami/cs6660-compiler-design-notes?next_slideshow=1
3. <https://www.javatpoint.com/lr-parser>
4. https://www.tutorialspoint.com/compiler_design/compiler_design_phases_of_compiler.htm
5. <https://byjus.com/gate/intermediate-code-generation-in-compiler-design-notes/>
6. <https://www.youtube.com/watch?v=F9ZoFP7D474>
7. <https://www.codingninjas.com/codestudio/library/code-generation-4403>

Pedagogy

Chalk & Talk, PPT, Group Discussion, Seminar and Assignment

Course Designer

Ms. K. Sangeetha

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE



M.Sc. COMPUTER SCIENCE

SYLLABUS

2022-2023 and Onwards



Cauvery College for Women (Autonomous), Trichy

PG & Research Department of Computer Science

M.Sc. Computer Science

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS- LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester IV

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
IV	Core Course – VIII(CC)	Big Data Analytics	22PCS4CC8	6	5	3	25	75	100
	Core Choice Course – III (CCC)	A. Robotic Process Automation	22PCS4CCC3A	6	4	3	25	75	100
		B.Virtual and Augmented Reality	22PCS4CCC3B						
		C. Digital Image Processing	22PCS4CCC3C						
	Core Practical -IV (CP)	FOSS (P)	22PCS4CC4P	6	5	3	40	60	100
	Generic Elective Course - II (GEC)	Animation (P)	22PCS4GEC2P	3	2	3	40	60	100
	Project	Project Work	22PCS4PW	9	5	-	-	100	100
Total				30	21	-	-	-	500

SEMESTER IV

Semester: IV	Internal Marks: 25		External Marks:75	
COURSECODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCS4CC8	BIG DATA ANALYTICS	CORE	6	5

Course Objective

- To provide knowledge about Big data Analytics
- To study the basic concepts on Data Science & Analytical Technologies
- To understand about Hadoop & MAPREDUCE fundamentals
- To inculcate knowledge about MongoDB & Analytics with R Machine

Prerequisites

Basic knowledge in Analytics, Data Mining, Database and Machine learning concepts

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CONumber	CO Statement	Cognitive Level
CO1	Understand the fundamentals of Big data analytics	K2
CO2	Describe the Hadoop architecture and Filesystem	K2
CO3	Apply the MapReduce Programming model for real-world problems	K3
CO4	Explore the concepts of NoSQL databases	K4
CO5	Design and assess a complete business data analytics solution	K5,K6

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO5
CO1	3	3	3	2	2	3	1	3	2	2
CO2	3	3	3	2	3	3	3	3	3	3
CO3	3	3	2	3	3	3	3	3	3	3
CO4	2	3	3	3	2	3	3	3	2	3
CO5	3	3	3	3	3	3	2	3	3	3

“1”-Slight (Low) Correlation
“3”-Substantial (High) Correlation

“2”– Moderate (Medium) Correlation
“-”- indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Types of Digital Data: Classification of Digital Data – Introduction to Big Data: Characteristics of Data- Evolution of Big Data – Definition of Big Data - Challenges with Big Data – Other characteristics of data - Need for Big Data - Traditional Business Intelligence versus Big Data - Data Warehouse and Hadoop Environment.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Understanding Analytics and Big Data: Comparing reporting and analysis - Types of Analytics – Points to consider during analysis – Developing an analytic team – Understanding text analytics.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Big data Technology: Hadoop. Introduction to Hadoop: Introducing Hadoop – Need for Hadoop- Limitations of RDBMS – RDBMS versus HADOOP- History of Hadoop – Hadoop overview - Interacting with Hadoop ecosystem – HDFS - Processing Data with Hadoop MapReduce – Managing resources and applications with Hadoop YARN - Introduction to MAPREDUCE programming.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Introduction to MongoDB: Need for MongoDB - Terms used in RDBMS and MongoDB - Data types in MongoDB - MongoDB Query Language.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Reading Datasets and Exporting Data from R: Using the c() Command - Using scan() Command – Reading multiple data values from large files - Reading data from R Studio – Exporting data from R. Working with Functions and Packages in R: Using functions instead of scripts – Using arguments in Functions – Built-in Functions in R – Introducing Packages – Working with Packages.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Exploring R .Manipulating and Processing Data in R - Introduction to Cassandra.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Seema Acharya, Subhashini Chellappan, (2015). *Bigdata and Analytics*, Wiley India Pvt. Ltd (Unit I, III-IV)
2. DT Editorial Services, (2017), *Big Data Black Book*, Dream Tech Press. (Unit- II, V)

Reference Books

1. V. Bhuvaneswari, T. Devi (2016). *Bigdata Analytics – A Practioner's Approach*, Bharathiyar University, Coimbatore
2. Michael Minelli, Michele Chambers, Ambiga Dhiraj (2013). *Big data Big Analytics*, Wiley
3. Bart Baesens (2014). *Analytics in a BigdataWorld*, Wiley

Web References

1. https://webopedia.com/TERM/B/big_data_analytics.html
2. <https://www.coursera.org/learn/big-data-introduction>
3. <https://hadoop.apache.org/>
4. <https://www.tutorialspoint.com/cassandra/index.htm>
5. <https://www.edureka.co/blog/mapreduce-tutorial/>

Pedagogy

Chalk and Talk, Group discussion, Seminar, Quiz & Assignment.

Course Designer

Ms. A. Sahaya Jenitha

Semester: IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCS4CCC3A	ROBOTIC PROCESS AUTOMATION	CORE CHOICE	6	4

Course Objective

- Understand the RPA and differentiate from other types of automation
- Outline the benefits of RPA and its various platforms
- Summarize the Risks and Challenges of RPA

Prerequisites

Knowledge in Programming languages and algorithmic way of understanding and thinking capability

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	List and Interpret RPA, where it can be applied	K1, K2
CO2	Explain and Identify the usage of AI	K2, K3
CO3	Make use of and distinguish the process and its automation	K3, K4
CO4	Compare and Evaluate the bots	K4, K5
CO5	Assess the RPA and its use cases in various domains	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	2	3	2	3	3	2	2	3
CO2	2	2	3	3	3	3	3	2	3	3
CO3	3	3	2	3	1	3	3	3	2	1
CO4	2	2	3	2	3	3	2	1	3	3
CO5	3	3	2	2	1	3	3	2	1	1

“1”–Slight (Low) Correlation
“3”–Substantial (High) Correlation

“2”–Moderate (Medium) Correlation
“-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	INTRODUCTION TO ROBOTIC PROCESS AUTOMATION: Definition-Benefits of RPA, Types of RPA, RPA tools-Automation Anywhere-CRM Automation-Extracting the customer list from CRM-Looking up customer information	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	MODERATING SOCIAL MEDIA USING AI: Reading parameters from the configuration file-passing the configuration parameters to the main workflow-reading image files from input and create a list-setting up the google cloud vision API services-looping through images and invoking google cloud vision API-updating the image sheet with API results-passing the parameters and invoking safesearch -Testing the automation- PURCHASE ORDER PROCESSING WITH UIPATH REFRAMEWORK: Purchase order performer-init state changes-process state changes-	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	SALES ORDER PROCESSING: Creating the parent bot-creating the child bot for SO processing-invoking the child bot and updating excel sheet- ERP USER ADMINISTRATION: creating the child bot for new user creation- EMPLOYEE EMERGENCY NOTIFICATIONS:- create a child bot to send messages-create the parent bot-testing the automation	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	INTELLIGENT DOCUMENT PROCESSING- Uipath Document understanding-creating the IQ Bot learning instance-uploading invoices to IQ Bot-Downloading Structured data from IQ bot	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	RPA IN ENTERPRISE: Security and Error Handling-robot platform security-cognitive automation technology and smart process automation- BRINGING YOUR ROBOTS TO LIFE-THE DEVELOPMENT PROCESS: Scoping an RPA project-robotic validations-becoming an automation consultant	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) RPA Use cases: Retail -Healthcare-Finance and Accounting-BPO-Web application Automation	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Nandan Mullakara and Arun Kumar Asokan(2020). *Robotic Process Automation Projects*. Packt Publishing.(UNITS I-IV)
2. Richard Murdoch (2018). *Robotic Process Automation*. RPA Ultra.(UNIT V)

Reference Books

1. Frank Casale, Rebecca Dilla, Heidi Jaynes, Lauren Livingston (2015). *Introduction to Robotic Process Automation: a Primer*.1stEdition, Institute of Robotic Process Automation.
2. Richard Murdoch (2018). *Robotic Process Automation: Guide to Building Software Robots, Automate Repetitive Tasks and become an RPA Consultant*.1st Edition, Independently Published.
3. Srikanth Merianda (2018). *Robotic Process Automation Tools, Process Automation and their benefits: Understanding RPA and Intelligent Automation*.1st Edition, Consulting Opportunity Holdings LLC.
4. Lim Mei Ying (2018). *Robotic Process Automation with Blue Prism Quick Start Guide: Create software robots and automate business processes*.1st Edition, Packt Publishing.

Web References

1. <https://www.uipath.com/rpa/robotic-process-automation>
2. <https://www.academy.uipath.com>
3. <https://www.edureka.co/blog/rpa-tutorial/>
4. <https://www.udemy.com/course/robotic-process-automation/>
5. <https://www.guru99.com/robotic-process-automation-tutorial.html>
6. <https://www.automationanywhere.com/in/robotic-process-automation>
7. <https://www.uipath.com/blog/learning-robotic-process-automation-through-video-tutorials>
8. https://onlinecourses.nptel.ac.in/noc21_me32/preview

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz and Seminar

Course Designer

Dr. D. Radhika

Semester: IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCS4CCC3B	VIRTUAL AND AUGMENTED REALITY	CORE CHOICE	6	4

Course Objective

- Learn the fundamental Computer Vision, Computer Graphics and Human-Computer interaction Techniques related to Virtual Reality (VR)/Augmented Reality (AR)
- To review the Virtual Environment and the various types of Hardware and Software in Virtual Reality systems
- To Simulate and Apply Virtual/Augmented Reality to varieties of Applications

Prerequisites

Numerical & Statistical Methods, Artificial Intelligence & Machine Learning and Computer Aided Engineering

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand and Identify the fundamental Computer Vision, Computer Graphics and Human - Computer Interaction Techniques related to VR/AR	K1,K2
CO2	Interpret and Analyze various Geometric Modeling Techniques	K2,K3
CO3	Apply and Analyze the Virtual Environment	K3,K4
CO4	Analyze the VR/AR Technologies	K4
CO5	Examine the VR/AR Technologies on real time applications	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO5
CO1	3	3	3	2	2	3	3	3	2	2
CO2	3	3	3	2	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation

“3”- Substantial (High) Correlation

“2”– Moderate (Medium) Correlation

“-”- indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Defining Virtual and Augmented Reality: Introducing Virtual Reality and Augmented Reality – Other types of Virtual and Augmented Reality –History – Father of Virtual Reality – Early Virtual Reality failures-Virtual Reality breaks through – Augmented reality hits the mainstream – Evaluating the Technology Hype Cycle.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Exploring the Current State of Virtual Reality & Augmented Reality: Looking at Available forms factors – Focusing on features – Considering controllers – Recognizing the current issues with VR – Assessing adoption rates	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Consuming Content in Virtual Reality : Exploring Consumers-Grade Virtual Reality – Identifying Near-Future Hardware – Comparing Current and Future options. Consuming Content in Augmented Reality : Exploring Consumers-Grade Augmented Reality – Identifying Near-Future Hardware – Comparing Current and Future options.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Evaluating Your Project: Choosing Virtual Reality – Choosing Augmented Reality. Planning Virtual Reality Project – Defining your Virtual Reality Project-Exploring Design Principles in Virtual Reality. Planning Augmented Reality Project – Defining your Augmented Reality Project – Exploring Design Principles in Augmented Reality – Defining your Social Experience.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Industries Transformed by Virtual and Augmented Reality: Travel – Museums – Aerospace – Retail – Military – Education – Entertainment - Real estate – Advertising and Marketing. – Mobile Apps for Experiencing Augmented Reality: Google translate – Amazon AR view –AR city – Ingress and Pokemon Go – Sketch AR – Find your car & Car finder AR	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Exploring Virtual Reality use cases – Exploring Augmented Reality use cases -Future of Virtual and Augmented reality	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. Paul Mealy (2018), *Virtual & Augmented Reality For Dummies*, John Wiley & Sons,

Reference Books

1. Bruno Arnaldi, Guillaume Moreau, Pascal Guitton, (2018), *Virtual Reality and Augmented Reality: Myths and Realities*, Wiley

Web References

1. <https://nptel.ac.in/courses/121106013>
2. <https://www.youtube.com/watch?v=zLMgdYI82IE>
3. <https://www.youtube.com/watch?v=MGuSTAqlZ9Q>

Pedagogy

Chalk and Talk, Group discussion, Seminar & Assignment

Course Designer

Ms. K. Pradeepa

Semester: IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCS4CCC3C	DIGITAL IMAGE PROCESSING	CORE CHOICE	6	4

Course Objective

- To impart the knowledge of image fundamentals and mathematical transforms necessary for image processing
- To understand the image enhancement techniques
- To study image compression procedures
- To study the image segmentation and representation techniques

Prerequisites

Basic Programming Skills, Linear Algebra, Differential Equations & Basics of Digital Electronics

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall and understand the algorithmic approach to illustrate the concepts of image processing	K1, K2
CO2	Understand the fundamental to the processing of digital images for specific tasks	K2
CO3	Solve real world problems by using digital image processing	K3
CO4	Analyze the images by using fundamental and advanced aspects of image processing	K4
CO5	Develop and evaluate the simplified tools for image processing	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	3	3	2	3
CO2	3	2	2	2	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	2	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Image Processing: Overview of Image Processing - Nature of Image Processing -Image Processing and Related Fields - Digital Image Representation - Types of Images – Digital Image Processing Operations – Fundamental Steps in Image Processing – Image Processing Applications- Colour Image Processing: Colour Models – Colour Quantization.	14	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Digital Imaging System: Overview of Digital Imaging System - Physical Aspects of Image Acquisition - Digital Image Transforms: Need for Image Transforms – Properties of Fourier Transform – Discrete Cosine Transform – Discrete Sine Transform –Walsh Transform – Hadamard Transform – Haar Transform – Slant Transform –SVD and KL Transforms.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Image Enhancement: Image Quality and Need for Image Enhancement – Image Enhancement Operations - Spatial Filtering Concepts – Image Smoothing in Frequency Domain Filtering. Image Restoration Image Degradation Model –Image Restoration in Presence of Noise only – Image Restoration Techniques	19	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Image Segmentation: Introduction –Classification of Image Segmentation Algorithms - Detection of Discontinuities - Edge Detection: Stages in Edge Detection, Types of Edge Detectors, First-order Edge Detection Operators, Second – order Derivative Filters, Edge Operator Performance-Hough Transforms and Shape Detection - CornerDetection - Principlesof Thresholding – Principles of Region-growing – Active Contour Models	19	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Image Compression: Image Compression Model–Compression Algorithms and its types– Types of Redundancy – Lossless Compression Algorithms – Lossy Compression Algorithms – Image and Video Compression Standards	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-Study for Enrichment: (Not included for End Semester Examinations) Case study: Face Recognition - Iris Recognition- Finger print Recognition - Signature Verification	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book

1. Dr. S. Sridhar.(2016). *Digital Image Processing*. 2nd Edition, Oxford University Press

Reference Books

1. Anil Jain K. (2011). *Fundamentals of Digital Image Processing*. PHILearningPvt.Ltd
2. Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins.(2011). *Digital Image Processing Using MATLAB*. 3rd Edition, TataMcGrawHillPvt. Ltd.
3. MalayK. Pakhira (2011). *Digital Image Processing And Pattern Recognition*, 1st Edition PHI Learning Pvt. Ltd.

Web References

1. <https://www.cs.nmt.edu/~ip/lectures.html>
2. <https://archive.nptel.ac.in/courses/117/105/117105135/>
3. <https://www.geeksforgeeks.org/digital-image-processing-basics/>
4. <https://www.javatpoint.com/digital-image-processing-tutorial>
5. <https://github.com/FlagArihant2000/dip-notes>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Ms. R. Sangeetha

Semester: IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCS4CC4P	FOSS (P)	CORE	6	5

Course Objective

- To expose students to FOSS environment
- To use and modify existing programs using open source packages/Technologies
- To inculcate knowledge in developing new software

Prerequisites

Knowledge in Programming Languages

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO 1	Ability to install and run open-source operating systems	K1
CO 2	Explain open source project structure and how to successfully setup a project	K2
CO 3	Use Github for Software development projects	K3
CO 4	Analyze various FOSS options for any software requirement	K4
CO 5	Develop and testing an applications using open source code	K5, K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	2	3	2	3	3	2	3	3
CO 2	3	3	3	3	3	3	3	3	3	3
CO 3	3	3	3	3	3	3	3	2	3	3
CO 4	3	3	3	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” - indicates there is no Correlation

Syllabus

1. Linux
2. GIMP: GNU Image Manipulation Program
3. Shotcut
4. Apache Struts
5. Perl
6. Ruby
7. Mongo DB
8. PHP
9. Selenium

Web References

1. <https://www.vmware.com/>
2. <https://www.cyberciti.biz/tips/linux-unix-bsd-documentations.html>
3. <https://developer.gimp.org/api/2.0/>
4. <https://struts.apache.org/>
5. https://www.tutorialspoint.com/perl/perl_references.html
6. <https://www.ruby-lang.org/en/documentation/>
7. <https://docs.mongodb.com/manual/reference/database-references/>
8. <https://shotcut.org/tutorials/>
9. https://www.nptelvideos.com/php/php_video_tutorials.php
10. <https://www.coursera.org/learn/selenium-webdriver-python>

Pedagogy

Demonstration

Course Designer

Dr.K.Reka

Semester: IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCS4GEC2P	ANIMATION (P)	GENERIC ELECTIVE COURSE	3	2

Course Objective

- To give an overall view of animation tools
- To learn the basic concepts of animation as an art.
- Explore the various photo editing features and animation techniques
- To create different types of animation using Flash

Prerequisites

Basic Computer Skills

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand the basic concepts behind animation	K2
CO2	Develop an animated movie	K3
CO3	Analyze the tools and techniques to create 2D and 3D animation	K4
CO4	Recommend the suitable methods available to create, render, and present images with professional quality	K5
CO5	Create simple shapes and videos using animation editing software	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	3	3	2
CO2	3	3	3	3	2	3	3	2	3	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	2	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” – indicates there is no Correlation.

List of Exercises

USING PHOTOSHOP

1. Create a logo using shapes, texture and filling colors.
2. Develop a banner of recent activity in your college or any festival.
3. Perform an animation on still photo.
4. Develop a collage and apply Morphing, Merging and Overlapping on the images.
5. Design a visiting card containing at least one graphic and text information.
6. Create a dancing doll using Frame by Frame Animation.
7. Develop a Webpage.

USING FLASH

1. Create an application using shapes, colors, text and images.
2. Design a Virtual Drumbeat using audio and video.
(Draw a circle to represent a drum and edit as required on one layer. Insert another layer, draw suitable drum sticks and position them appropriately. Give visual effects. Also provide audio effect by selecting the sound item from Flash library Sounds.fla, so as to integrate audio and video clips)
3. Design a Sunset
(Create a suitable background with clouds and mountains on one layer. Draw the Sun on another layer. On the third layer draw birds. Provide animation to show the birds flying across the Sun that keeps fading)
4. Create a Stickman Walk using Motion Tweening
5. Design an animation using Shape Tweening.
6. Create Morphing and Masking effects in images
7. Create a Bouncing Ball using Frame by Frame animation

Web References

1. <https://www.adorama.com/alc/how-to-edit-your-photos-5-photoshop-editing-steps-for-beginners/>
2. <https://www.youtube.com/watch?v=ceAGVMn-syQ>
3. <https://www.geeksforgeeks.org/types-of-animations-in-flash/>
4. <https://www.photoshopessentials.com/basics/>
5. <https://www.guru99.com/photoshop-tutorials.html>
6. <https://www.instructables.com/Basics-of-Photoshop/>

Pedagogy

Power Point Presentation, Live Demonstration

Course Designer

Ms. R. Sangeetha

Semester: IV	Internal Marks: -		External Marks:100	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDITS
22PCS4PW	PROJECT WORK	PROJECT	9	5

- To understand the problem identification from the real world requirements
- To inculcate technical skills through the suitable application development environment for modeling real-world problems
- To expose the students to analyze various software testing tools and techniques before deploying the product

EVALUATION PATTERN FOR PROJECT

Components	Marks
Dissertation	80
Problem Identification – 20	
Domain Knowledge - 20	
Presentation - 20	
Communication Skills - 20	
Viva Voce	20
Total	100

ANNEXURE K

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
Nationally Accredited (III Cycle) with “A” Grade by NAAC
ISO 9001:2015 Certified
Annamalai Nagar, Trichy – 18.



DEPARTMENT OF COMPUTER APPLICATIONS
AUTONOMOUS SYLLABUS
BOARD OF STUDIES – 9
2023 – 2024



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

DEPARTMENT OF COMPUTER APPLICATIONS

BCA

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2023-2024 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total	
							Hrs.	Marks			
								Int	Ext		
II	I	Language Course – II (LC)	Podhu Tamil –II	23ULT2	6	3	3	25	75	100	
			Hindi Literature & Grammar – II	22ULH2							
			Prose,Grammer and History of Sanskrit literature	23ULS2							
			Basic French–II	22ULF2							
	II	English Language Course - II (ELC)	General English -II	23UE2	6	3	3	25	75	100	
	III	Core Course – II (CC)	Programming in C++	23UCA2CC2	4	4	3	25	75	100	
		Core Practical - II (CP)	Programming in C++ (P)	23UCA2CC2P	3	3	3	40	60	100	
		Core Course -III (CC)	Data Structures	22UCA2CC3	3	3	3	25	75	100	
		First Allied Course – III (AC)	Operations Research	22UCA2AC3	4	3	3	25	75	100	
	IV	Ability Enhancement Compulsory Course - II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100	
		Ability Enhancement Compulsory Course - III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100	
	Extra Credit Course		SWAYAM		As per UGC Recommendation						
	Total					30	22				800

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23UCA2CC2	Programming in C++	CORE	4	4

Course Objectives

- To make the student learn a programming language.
- To learn problem solving techniques.
- To teach the student to write programs in C++ and to solve the problems.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the fundamental concepts of object-oriented program	K1
CO2	Illustrate the components of C++ program	K2
CO3	Build algorithms and data structures swiftly and faster computation using programs	K3
CO4	Apply programming knowledge to develop programs	K4
CO5	Solve real time problems using C++ concepts	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	3	3	3	3	3	3	3	3	2
CO4	3	3	3	2	3	3	3	2	3	2
CO5	3	3	2	2	2	3	2	2	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Principles of OOPS: Basic Concepts of Object - Oriented Programming - Benefits of OOP. Beginning with C++: Structure of C++ Program - Compiling and linking – Tokens - Control Structures – Keywords – Identifiers and Constants – Basic Data Types – User-Defined Data Types – Storage Classes – Derived Data Types – Symbolic Constants – Type Compatibility – Declaration of Variables – Dynamic Initialization of Variables – Reference Variable – Scope Resolution Operator – Member Dereferencing Operators – Manipulators - Type Cast Operator – Expressions and Their Types – Implicit Conversions – Control Structures	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Function in C++: The Main Function – Function Prototyping – Call by Reference – Return by Reference – Inline Function – Default Arguments – Const Arguments – Recursion – Function Overloading – Friend and Virtual Function – Math Library Function. Classes and Objects: Specifying a Class – Defining Member Functions – Making an Outside Function Inline – Nesting of Member Functions – Private Member Functions – Arrays within a Class – Static Data Members – Static Member Functions – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects – Const Member Functions – Local Classes	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Constructors and Destructors: Constructors – Parameterized Constructors – Multiple Constructors in a Class – Constructors with Default Arguments – Dynamic Initialization of Objects – Copy Constructors – Dynamic Constructors – Constructing Two-Dimensional Array – Const Objects – Destructors. Operator Overloading and Type Conversion: Defining Operator Overloading – Overloading Unary Operator - Overloading Binary Operator - Overloading Binary Operator using Friends – Manipulation of Strings using Operators – Rule for Overloading Operators	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Inheritance: Defining Derived Classes – Single Inheritance – Making a Private Member Inheritable – Multilevel Inheritance - Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes – Abstract Classes – Constructors in Derived Classes – Member Classes: Nesting of Classes	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Pointers, Virtual Functions and Polymorphism: Pointers – Pointers to Objects – this Pointer – Polymorphism – Pointers to Derived Classes – Virtual Functions – Pure Virtual Functions – Virtual Constructors and Destructors. Managing Console I/O Operations: Unformatted I/O Operations – Formatted Console I/O Operations	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self Study for Enrichment (Not to be included for External Examination) Software Crisis – Software Evolution – Application of OOP – Application of C++ - Operators in C++ - C Structures Revisited	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

1. Balagurusamy. E. (2022). Object Oriented Programming with C++, 8th Edition, Tata McGraw Hill Education Pvt.Ltd.

References

1. Robert Lafore (2018). Object-Oriented Programming in C++, 6th Edition, Pearson Education, New Delhi.
2. Bjarne Stroustrup (2012). The C++ Programming Language, 4th Edition, Pearson Education and Dorling Kindersley.
3. Herbert Schildt (2009). The Complete Reference C++, 4th Edition, Tata Mc-Graw Hill Edition, New Delhi.

Web References

1. <https://cplusplus.com/doc/tutorial/>
2. <https://www.w3schools.com/cpp/>
3. <https://www.tutorialspoint.com/cplusplus/index.htm>

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications.

	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23UCA2CC2P	Programming in C++ (P)	CORE	3	3

Course Objective

- To make the student learn a programming knowledge.
- To teach the student to write programs to solve the problems.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, students will be able to	Cognitive Level
CO1	Identify the logic for a given problem	K1
CO2	Recognize the syntax and construction of C++ programming code	K2
CO3	Apply the steps involved in compiling, linking and debugging C++ code	K3
CO4	Analyze the concepts of overloading, friend function, inheritance, abstract class and polymorphism	K4
CO5	Create C++ programs using all the concepts that have been covered in the theory course	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	2	3	3
CO5	3	3	2	2	2	3	2	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

List of Practical

1. Simple Program.
2. Condition Statements.
3. Looping Statements.
4. Friend Function.
5. Constructor and Destructor.
6. Operator Overloading.
7. Function Overloading.
8. Inheritance.
9. Abstract Class.
10. Polymorphism.

Web References

4. <https://www.programiz.com/cpp-programming/examples>
5. <https://www.geeksforgeeks.org/cpp-programming-examples/>
6. https://www.w3schools.com/cpp/cpp_examples.asp

Pedagogy

PowerPoint Presentation, Demonstration, Discussion and Practical Session.

Course Designer

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications.

IV SEMESTER



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF COMPUTER APPLICATIONS
BCA

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS – LOCF)
(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs./ week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
IV	I	Language Course - IV (LC)	Pandaiya Illakiyamum Urainadaiyum	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French - II	22ULF4						
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature - II	22UE4	6	3	3	25	75	100
	III	Core Course – V(CC)	Programming in Python	22UCA4CC5	6	6	3	25	75	100
		Core Practical – IV (CP)	Programming in Python (P)	22UCA4CC4P	4	4	3	40	60	100
		Second Allied Course- III (AC)	Business Communication	22UCA4AC6	4	3	3	25	75	100
		Internship	Internship	22UCA4INT	-	2	-	100	-	100
	IV	Generic Elective Course - II (GEC)	Animation Tools - II (P)	22UCA4GEC2P	2	2	3	40	60	100
			Basic Tamil - II	22ULC4BT2				25	75	
			Special Tamil - II	22ULC4ST2						
		Skill Enhancement Course – I(SEC)	Documentation and Presentation Tools (P)	22UCA4SEC1P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM		As per UGC Recommendation					
	Total					30	25			

Semester IV	Internal Marks:25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UCA4CC5	Programming in Python	CORE	6	6

Course Objectives

- To make students understand the concepts of Python programming
- To impart knowledge on demand and supply concepts
- To design and program Python applications

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Outline the basic syntax and semantics of python programming language	K1
CO2	Summarize the problem-solving approach using python statements	K2
CO3	Build the python program using modules	K3
CO4	Examine the python programming concepts to develop programs	K4
CO5	Develop a python program to solve real-time problems	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1”- Slight (Low) Correlation

“2”- Moderate (Medium) Correlation

“3” –Substantial (High) Correlation

“-” - Indicates there Is no Correlation

Syllabus

UNIT	Contents	HOURS	COs	COGNITIVE LEVEL
I	Basics of Python Programming: Python Character Set-Token-Python Core Data Type-The print() Function-Assigning Value to a Variable-Multiple Assignments-Writing Simple Programs in Python-The input() Function- The eval() Function- Formatting Number and Strings-Python In built Functions	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Operators and Expressions: Introduction-Operators and Expressions-Arithmetic Operators-Operator Precedence and Associativity-Bitwise Operator. Decision Statements: Introduction-Boolean Type-Boolean Operators-Decision Making Statements-Conditional Expressions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Loop Control Statements: Introduction-The while Loop-The range() Function-The for Loop-Nested Loops-The break Statement-The continue Statement. Functions: Introduction-Syntax and Basics of a Function-Use of a Function-Parameters and Arguments in a Function-The Local and Global Scope of a Variable-The return Statement-Recursive Functions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Strings: Introduction-The str class- Basic Inbuilt Python Functions for String- The index[] Operator-Traversing String with for and while Loop-Immutable Strings-The String Operators-String Operations. Lists: Introduction-Creating Lists-Accessing the Elements of a List-Negative List Indices-List Slicing [Start : end]- Python Inbuilt Functions for Lists-The List Operator-List Methods-List and Strings-Splitting a String in List- Passing List to a Function-Returning List from a Function	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Tuples, Sets and Dictionaries: Introduction to Tuples-Sets-Dictionaries. File Handling: Introduction-Need of File Handling-Text Input	18	CO1, CO2,	K1, K2,

	and Output- The seek() Function-Binary Files.		CO3, CO4, CO5	K3, K4, K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Changing Precedence and Associativity- The Compound Assignment Operator-Using Numbers with Boolean Operators-Using String with Boolean Operators-The Lambda Function- List Slicing with Step Size	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

1. Ashol Namdev Kamthane (2018). Programming and problem solving with Python, McGraw Hill Education(India) Private Limited.

References

1. VamsiKurama (2018). Python Programming: A Modern Approach, Pearson Education.
2. Reema Thareja (2017). Python Programming using Problem Solving Approach, Oxford University
3. Mark Lutz (2013). Learning Python, 5th Edition, Orielly.
4. Adam Stewarts (2017). Python Programming, Create Space Independent Publishing Platform
5. Kenneth A. Lambert, Fundamentals of Python – First Programs (2019). CENGAGE Publication.

Web References

1. <https://www.programiz.com/python-programming>
2. <https://www.guru99.com/python-tutorials.html>
3. https://www.w3schools.com/python/python_intro.asp
4. <https://www.geeksforgeeks.org/python-programming-language/>
5. [https://en.wikipedia.org/wiki/Python_\(programming_language\)](https://en.wikipedia.org/wiki/Python_(programming_language))

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr.K.Akila, Associate Professor, Department of Computer Applications.

Semester IV	Internal Marks:40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UCA4CC4P	Programming in Python (P)	CORE	4	4

Course Objectives

- Be able to design programs using math functions and numbers
- Be able to create loops and decision statements in Python.
- Be able to work with functions and pass arguments in Python.
- Be able to read and write files in Python.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recognize the syntax and semantics of Python	K1
CO2	Identify suitable techniques to construct a Python program.	K2
CO3	Implement the concepts of numbers, math functions and string functions in Python	K3
CO4	Analyze the logical structures which are used to the real-time applications.	K4
CO5	Develop a real-time application using Python programming	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1”-Slight(Low)Correlation

“2”-Moderate(Medium)Correlation

“3” -Substantial(High)Correlation

“-”- Indicates there Is no Correlation

List of Practical

1. Program using variables, constants, I/O statements in Python.
2. Program using In-built Math functions.
3. Program using Operators in Python.
4. Program using Conditional Statements.
5. Program using Loops.
6. Program using Jump Statements.
7. Program using Functions.
8. Program using Recursion.
9. Program using Strings.
10. Program using Lists.
11. Program using Tuples.
12. Program using Dictionaries.
13. Program using Set Operations.
14. Program for File Handling.

Web References

- 1 <https://www.programiz.com/python-programming>
- 2 <https://www.guru99.com/python-tutorials.html>
- 3 https://www.w3schools.com/python/python_intro.asp
- 4 <https://www.geeksforgeeks.org/python-programming-language/>
- 5 [https://en.wikipedia.org/wiki/Python_\(programming_language\)](https://en.wikipedia.org/wiki/Python_(programming_language))

Pedagogy

PowerPoint Presentation, Discussion and Practical Sessions.

Course Designer

Dr.K.Akila, Associate Professor, Department of Computer Applications.

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCA4GEC2P	Animation Tools-II (P)	GEC	2	2

Course Objective

- To impart training on Tools in Flash

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Learn the basic concepts of animation as an art.	K1
CO2	Apply different types of tools	K3
CO3	Use trace and mask in image	K3
CO4	Create shape & motion tweening	K4
CO5	Develop 2D animations	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	2	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

List of Practical

- Basics of Flash
- Types of Tools
- Trace a Character in Flash
- Working with Masking
- Create Animation using Text
- Demonstrate Shape & Motion Tween
- Develop a commercial brochure
- Create a Snowfall Animation using Flash

Web References

1. <https://helpx.adobe.com/in/flash/tutorials.html>
2. <https://www.geeksforgeeks.org/flash/>

Pedagogy

Power Point Presentation, Demonstration and Practical Sessions.

Course Designer

Ms. M. Ellakkiya, Assistant Professor, Department of Computer Applications.

Semester IV	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCA4SEC1P	Documentation and Presentation Tools (P)	SEC	2	2

Course Objective

- To impart training on Multimedia Tools

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements	Cognitive level
	On the successful completion of the course, students will be able to	
CO1	Creating documents using template in MS–word	K1
CO2	Demonstrate usage of slides in MS–Power point	K2
CO3	Creating slides with Multimedia tools	K3
CO4	Ability to understand the various kinds of tools.	K2
CO5	Develop e-content in power point by their own	K4

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1”–Slight (Low) Correlation

“2”–Moderate (Medium) Correlation

“3”–Substantial (High) Correlation

“-”- indicates there is no correlation

List of Practical

1. Working with MS Word:

- Text Manipulation–Change the font type and style, alignment of text and underline the text
- Prepare a document with Bullets, Footers and Headers
- Prepare a document in newspaper format
- Manipulation of Table–Creation, insertion, deletion (Columns and rows)
- Create a Mark Sheet using table and find out total of all marks for each student

- Prepare a Greeting Card: Picture insertion and alignment
- Create a document using template
- Prepare a Letter
- Prepare a Biodata
- Mail Merge:- Prepare Convocation invitations to be sent to specific addresses in the data source.

2. **Creating Powerpoint Presentation**

Slide show presentation for a seminar chooses your own topics.

- Enter the text in outline view
- Create on – bulleted and bulleted body text
- Apply the appropriate text attributes
- Presentation using wizards -Usage of design templates: - Creation of a slide show presentation using different presentation template and different transition effect for each slide. Use different text attributes in each slide.
- Develop an e-content in power point using multimedia tools (10 slides)

Web References

1. <https://support.microsoft.com › en-us › office › add-and>
2. <https://www.javatpoint.com › how-to-insert-picture-an.>
3. <https://www.javatpoint.com › excel-work-sheet-rows-c..>

Pedagogy

Demonstration, Power point Presentation, Discussion and Practical Session.

Course Designer

Dr. T. Julie Mary, Assistant Professor, Department of Computer Applications.

V SEMESTER

Semester	Part	Course	Course Title	Course Code	Inst. Hrs./ week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
V	III	Core Course – VI (CC)	Programming in PHP	22UCA5CC6	6	6	3	25	75	100
		Core Practical – V (CP)	PHP with MySQL (P)	22UCA5CC5P	4	4	3	40	60	100
		Core Course – VII (CC)	Software Engineering	22UCA5CC7	6	6	3	25	75	100
		Core Course – VIII (CC)	Data Mining	22UCA5CC8	5	5	3	25	75	100
		Discipline Specific Elective – I (DSE)	MATLAB (P)	22UCA5DSE1AP	5	4	3	40	60	100
	Data Mining (P)		22UCA5DSE1BP							
	R Programming (P)		22UCA5DSE1CP							
	IV	Ability Enhancement Compulsory Course – IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Data Analytics using Excel (P)	22UCA5SEC2P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM		As per UGC Recommendation					
	Total					30	29			

Semester V	Internal Marks:25		Marks:75		External
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS	
22UCA5CC6	Programming in PHP	CORE	6	6	

Course Objectives

- To understand the fundamentals of web programming for design a web page using PHP.
- The students shall be able to develop a simple webpage using PHP with MySQL.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Outline the basic concepts in PHP Programming	K1
CO2	Describe the logical structure of PHP Programming	K2
CO3	Construct the web page using PHP Programming	K3
CO4	Analyze the PHP Programming concepts to develop Website	K4
CO5	Develop a real-time website using PHP Programming	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	2	3	3	3	3	3	3	2	2
CO4	3	2	2	2	2	3	3	2	2	2
CO5	3	2	2	2	2	3	3	2	2	2

“1”-Slight (Low) Correlation

“2”-Moderate (Medium) Correlation

“3”- Substantial (High) Correlation

“-”- Indicates there is no Correlation

Syllabus

UNIT	Contents	HOURS	COs	COGNITIVE LEVEL
I	Essential PHP Essential PHP: Creating your Development Environment - Creating a First PHP Page-Mixing HTML and PHP - Printing Some Text- Printing Some HTML- More Echo Power- Using PHP “Here” Documents - Adding Comments to PHP - Variables - Constants - Data Types, Operators and Flow Control.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	PHP Basics Strings and Arrays - Creating Functions- Reading Data in Web Pages: Setting Up Web Pages to Communicate with PHP - Handling Text Fields and Text Areas- Handling Check Boxes and Radio Buttons - Handling List Boxes, Password Controls, Hidden Controls, Image Maps, File Uploads and Buttons.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	OOPS Concepts Object-Oriented Programming: Creating Classes and Objects - Setting Access to Properties and Methods - Using Constructors and Destructors - Inheritance - Overriding, Overloading Methods, Autoloading Classes. Advanced Object-Oriented Programming: Creating Static Methods, Abstract Classes, Interfaces and Class Constants, Supporting Object Iteration - Using Final Keyword - Cloning Objects - Reflection.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Browser-Handling, Session, Cookies and FTP PHP Browser-Handling Power – Session, Cookies and FTP: Setting, Reading, Deleting Cookies - Working with FTP - Downloading, Uploading, and Deleting a File with FTP - Creating and Removing Directories with FTP - Working with E-mail- Storing Data and Writing a Hit Counter using Sessions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	File Handling and MySQL using PHP File Handling - Working with Databases: Accessing the Database in PHP -Update Data into the Database- Insert Data into the Database - Delete Data from Database.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) History of PHP – Getting PHP – PHP’s Internal Data Types –Working with Database: What is Database? – Some Essential SQL – Creating a MySQL Database and Table – Putting data into the New Database.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

1. Steven Holzner. (2012), The Complete Reference PHP, Tata McGraw Hill Pvt. Ltd.

References

1. Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre. (2013), Programming PHP, 3rd Edition, O'Reilly.
2. Luke Welling, Laura Thomson. (2017), PHP and MySQL Web Development, 5th Edition, Pearson India Education Services Pvt. Ltd.

Web References

1. <https://www.phptutorial.net/>
2. <https://www.javatpoint.com/php-tutorial>
3. <https://www.w3schools.com/php/>
4. <https://www.geeksforgeeks.org/php-examples/>
5. <https://www.tutorialspoint.com/php/index.htm>

Pedagogy

Chalk &Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. V. Yasodha, Assistant Professor, Department of Computer Applications.

Semester V	Internal Marks:40		External Marks:60	
COURSECODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCA5CC5P	PHP with MySQL (P)	CORE	4	4

Course Objectives

- To inculcate the PHP web programming knowledge
- To create a basic knowledge about developing web page.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the syntax and semantics of PHP.	K1
CO2	Identify suitable techniques to construct a web page.	K2
CO3	Implement the PHP concepts to develop a website	K3
CO4	Analyze the logical structures which are used to the real-time applications.	K4
CO5	Develop a real-time application using PHP programming	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	2	3	3	3	3	3	3	2	2
CO4	3	2	2	2	2	3	3	2	2	2
CO5	3	2	2	2	2	3	3	2	2	2

“1”-Slight (Low) Correlation

“3”- Substantial (High) Correlation

“2”-Moderate (Medium) Correlation

“-”- Indicates there is no Correlation

List of Practical

1. Basic HTML tags.
2. get() and post() methods.
3. Validation.
4. String Handling functions.
5. Arrays.
6. COOKIES.
7. SESSIONS.
8. FILE Handling.
9. Database Connection.

Web References

1. <https://www.phptutorial.net/>
2. <https://www.javatpoint.com/php-tutorial>
3. <https://www.w3schools.com/php/>
4. <https://www.geeksforgeeks.org/php-examples/>
5. <https://www.tutorialspoint.com/php/index.htm>

Pedagogy

PowerPoint Presentations, Demonstrations and Practical Sessions.

Course Designer

Ms. V. Yasodha, Assistant Professor, Department of Computer Applications.

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCA5CC7	Software Engineering	CORE	6	6

Course Objectives

- To make the students to understand basics of software engineering
- To provide knowledge in various phases of Software Engineering Process
- To apply object-oriented analysis and design concepts

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Describe the basics of Software Engineering	K1
CO2	Summarize the design models	K2
CO3	Explain object-oriented analysis and design concepts	K4
CO4	Demonstrate the coding of a software	K3
CO5	Evaluate various software testing techniques	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1	3	3	2	3	1
CO2	3	2	3	2	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	2	2	2	3	3	2	3	1
CO5	2	3	3	2	2	2	3	2	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	Contents	HOURS	COs	COGNITIVE LEVEL
I	Software Engineering-Introduction: Introduction to Software Engineering -Software Process - Software Process Models -Software product. Requirements Engineering Principles: Introduction - Types of Requirements - Steps involved in Requirement Engineering.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Requirement Analysis Modeling: Analysis Modeling Approaches - Structured Analysis - Object Oriented Analysis. Design and Architectural Engineering: Design Process and Concepts - Basic Issues in Software Design - Characteristics of Good Design - Software Design and Software Engineering - Modularity, Cohesion, Coupling, Layering - Real Time Software Design -Design Models	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Object Oriented Concepts: Introduction - Fundamental Parts of Object-Oriented Approach - Data Hiding and Class Hierarchy Creation - Relationships - Design Patterns – Frameworks. Object Oriented Analysis and Design: Object Oriented Analysis - Object Oriented Design.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	User Interface Design: Concepts of User Interface - Elements of User Interface -Designing the User Interface - User Interface Evaluation -Golden Rules of User Interface Design - User Interface Models – Usability. Software Coding: Introduction - Coding Conventions – Key Concepts in Software Coding.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Introduction to Software Testing: Introduction - Software Testing Objectives - Types of Software Testing. Software Maintenance: Introduction - Maintenance Activities - Maintenance Process -	18	CO1, CO2, CO3,	K1, K2, K3,

	Maintenance Cost - Software Evolution - Reverse Engineering - Re-engineering - Re-structuring - Maintenance Strategies - Issues in Software Maintenance.		CO4, CO5	K4, K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Requirements Engineering - Importance of Requirements - Function Oriented System vs Object Oriented System Models - Design Documentation - Role of UML in OO Design – Programming Principles – Programming Guidelines – Psychology of Testing – Software Testing Scope - Strategic Approach to Software Testing	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

1. Chandramouli Subramanian, Saikat Dutt, Chandramouli Seetharaman, B.G.Geetha, (2018). Software Engineering, Pearson Publications.

References

1. Jibitesh Mishra, (2011). Software Engineering, Pearson Education.
2. Richard E. Fairley, (2001). Software Engineering Concepts, Tata McGraw-Hill Publishing Company Ltd.
3. Roger S.Pressman, Bruce R.Maxim, (2014). Software Engineering: A Practitioner's Approach, Tata McGraw-Hill Publishing Company Ltd.

Web References

1. https://www.tutorialspoint.com/software_engineering/
2. <https://www.geeksforgeeks.org/software-engineering/>
3. <https://www.slideshare.net/pashadon143/se-46394097/>

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms.A.Jabeen, Assistant Professor, Department of Computer Applications.

Semester V	Internal Marks : 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCA5CC8	Data Mining	CORE	5	5

Course Objectives

- To introduce the concept of data mining as an important tool for enterprise management
- To enable effective sources of data and process it for data mining
- Enhance all data mining algorithms and methods of evaluation

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements	Cognitive Level
CO1	On the successful completion of the course, the students will be able to Illustrate the fundamental concepts, benefits, and problem areas Associated with data mining.	K1
CO2	Elaborate different steps involved in the process of data preprocessing.	K2
CO3	Summarize various models of data warehousing and online analytical processing.	K3
CO4	Classify algorithm to predict accurately the target class of objects.	K4
CO5	Evaluate the working pattern of the cluster analysis algorithm.	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	1	2	1	1	2	2	1	1	3	1
CO2	1	2	2	1	1	1	2	2	1	2
CO3	2	3	2	3	2	3	2	3	3	2
CO4	2	3	1	3	2	2	3	3	2	2
CO5	1	3	2	2	2	3	3	2	2	3

“1”–Slight (Low) Correlation

“2”– Moderate (Medium) Correlation

“3”–Substantial (High) Correlation

“-”-indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Data Mining– Moving towards the Information Age-Data Mining the Evolution of Information Technology– Kinds of Data Can Be Mined – Kinds of Patterns Can Be Mined– Technologies–Applications– Major issues in Data Mining.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Data Preprocessing: Data Preprocessing: An Overview – Data Cleaning – Data Integration-Entity Identification Problem - Redundancy & Correlation Analysis – Data Reduction – Data Transformation and Data Discretization–Data Transformation Strategies Overview	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Data Warehousing and Online Analytical Processing: Data Warehouse: Basic Concepts – DataWarehouse Modeling-Data Cube and OLAP - Data Cube: A Multidimensional Data Model Stars, Snowflakes, and Fact Constellations: Schemas for Multidimensional Data Models - Typical OLAP Operations – Data Warehouse Design and Usage.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Mining Frequent Patterns, Associations, and Correlations: Basics Concepts and Methods: Basic Concepts – Frequent Item set Mining Methods - Apriori Algorithm- Finding Frequent Item sets by Confined Candidate Generation - Generating Association Rules from Frequent Item sets - Classification: Basic Concepts: Basic Concepts–Decision Tree Induction- Decision Tree Induction–Attribute Selection Measures- Bayes Classification Methods	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Cluster Analysis: Basic Concepts and Methods: Cluster Analysis-Partitioning Methods– k-means– Hierarchical Methods: Agglomerative versus Divisive Hierarchical Clustering – Distance Measures in Algorithmic Method–Outlier Detection: Outliers and Outlier Analysis – Outlier Detection Methods- Data Mining Trends and Research Frontiers: Data Mining Applications.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Predictive analysis-it's working-Analytical techniques-Area of Text mining-Text Mining process-Introduction to sentiment analysis- Types of sentiment analysis-Rule Based Classification	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

Jiawei Han and Micheline Kamber(2012). Data Mining Concepts and Techniques, Third Edition.

References

1. Margaret H.Dunham (2003).Data Mining: Introductory and Advanced Topics,Pearson Education.
2. Arun K.Pujari (2010).Data Mining Techniques, University Press.

Web References

1. www.tutorialspoint.com
2. <https://www.techopedia.com/definition/15634/web-mining>
3. <https://www.expertsystem.com/data-mining-predictive-analytics-difference/>
4. <https://data-flair.training/blogs/text-mining/>

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. T. Julie Mary, Assistant Professor, Department of Computer Applications.

Semester V	Internal Marks : 40		External Marks : 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCA5DSE1AP	MATLAB (P)	DSE	5	4

Course Objective

- To develop programming skills and technique to solve mathematical problems

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements	Cognitive Level
CO1	On the successful completion of the course, students will be able to Identify the logic for a given a problem	K1
CO2	Recognize the syntax and construction of MATLAB programming code	K2
CO3	Analyze the concepts various functions	K3
CO4	Interpret and visualize simple mathematical functions and operations	K4
CO5	Implement simple mathematical functions/equations in numerical computing environment	K4

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	2	1	2	2
CO2	3	2	3	2	1	3	2	2	3	3
CO3	3	3	3	2	2	3	2	2	3	2
CO4	3	2	3	2	2	3	3	1	3	2
CO5	3	3	3	2	2	3	3	1	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

List of Practical

1. Arithmetic Operations
2. Complex Numbers
3. Control Flow
4. Array Indexing
5. Functions

6. Matrix Operations
7. Plotting
8. Image Processing
9. Mathematical Computing
10. Packages

Web References

3. <https://www.math.unipd.it/~mrrusso/Didattica/NA-Yaounde/LAB1/Exercises1.pdf>
4. <https://engineering.servicelearning.ucmerced.edu/sites/engineering.servicelearning.ucmerced.edu/files/page/documents/lab1finalversionpdf.pdf>
5. https://lo.unisa.edu.au/pluginfile.php/724774/mod_resource/content/1/MME_1_Practicals_guide_2013_02_25.pdf

Pedagogy

PowerPoint Presentation, Demonstration, Discussion and Practical Sessions.

Course Designer

Ms. A. Anandhavalli, Assistant Professor, Department of Computer Applications.

Semester V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCA5DSE1BP	Data Mining (P)	DSE	5	4

Course Objective

- To impart training on data mining tasks with data mining toolkit-WEKA

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand how to perform data mining tasks using the WEKA Toolkit	K1
CO2	Recognize various kinds of implementation	K2
CO3	Demonstrate the Pre-processing, Classification, etc. in large data sets	K3
CO4	Ability to apply algorithms as a component to the existing tools	K3, K4
CO5	Implement simple mining techniques for realistic data.	K4

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	2	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

List of Practical

1. Data Exploration and Preprocessing
2. Classification
3. Performance Evaluation and other classifiers
4. Association Analysis
5. Clustering
6. Data Visualization
7. Knowledge Flow
8. Experimenter
9. Feature Selection

Web References

6. <https://cobweb.cs.uga.edu/~khaled/DMcourse/Weka-Tutorial-Exercises.pdf>
7. <https://ppawar.github.io/Spring2020/CSE351-S20/Exercises/Weka%20activity%20-%201%20April%2020.pdf>
8. https://uh.edu/~smiertsc/4397cis/Chapter_4_Using_WEKA.pdf

Pedagogy

PowerPoint Presentation, Demonstration, Discussion and Practical Sessions.

Course Designer

Ms. A. Anandhavalli, Assistant Professor, Department of Computer Applications.

Semester V	Internal Marks:40	External Marks: 60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UCA5DSE1CP	R Programming (P)	DSE	5	4

Course Objective

- To be able to perform operations using R Programming

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Understand and use R – Data Structures.	K2
CO2	Explain the basic functions to enhance the effective usage of R Programming	K2
CO3	Apply R programming and understand different data frames	K3
CO4	Organize R Programme using charts	K4
CO5	Analyze vector using R – programming capabilities	K4

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1”- Slight (Low) Correlation

“2”-Moderate (Medium) Correlation

“3” –Substantial (High) Correlation

“-” - Indicates there Is no Correlation

List of Practical

- Create three vectors such as numeric data, character data and logical data. Display the content of the vectors and their type.
- Create a simple bar plot of five subject marks of a student
- Create a function to print squares of numbers in sequence.
- Create data frames which contain details of 5 employees and display summary of the data.
- Create an array of two 3x3 matrices for two given vectors.
- Extract 3rd and 5th rows with 1st and 3rd columns from a given data frame.
- Generate inner, outer, left, right join (merge) from given two data frames.

8. Demonstrate use of histogram.
9. Demonstrate box plot function.
10. Create pie plot using R.

Web References

1. <https://www.jnec.org/labmanuals/it/te/sem1/R-lab.pdf>
2. <https://cdlsiet.ac.in/wp-content/uploads/2023/03/R-Language-Lab-Manual-lab-1.pdf>
3. <https://kottesandeep.blogspot.com/2022/03/r-programming-lab.html>

Pedagogy

PowerPoint Presentation, Discussion, Demonstration and Practical Session.

Course Designer

Dr.Lakshna Arun, Associate Professor, Department of Computer Applications

Semester V	Internal Marks:40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UCA5SEC2P	Data Analytics Using Excel(P)	SEC	2	2

Course Objective

- To be able to perform operations using EXCEL

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Make use of the basic formatting and editing options	K3
CO2	Interpret the data using Conditional formatting options in Excel	K2
CO3	Explain the purpose of using functions in the workbook	K2
CO4	Organize the data using pivot tables & pivot charts in MS-Excel	K3
CO5	Build the basic Lookup functions to enhance the effective usage of excel functions in the workbook	K4

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1”- Slight (Low) Correlation

“3” –Substantial (High) Correlation

“2”-Moderate (Medium) Correlation

“-” -Indicates there Is no Correlation

List of Practical

11. Basic Commands in Excel

- Creating & Saving Work Books
- Selecting Cells
- Entering Text & Numbers into Cells
- Naming The Cells
- Insert Rows & Columns
- Renaming Workbooks
- Move Or Copy Worksheets
- Auto Complete

12. Formatting & Filtering Using Excel

- Find & Replace
- Sort & Replace
- Data Validation
- Remove Duplicates
- Import Data from Different Resources
- Freeze Panes
- Mail Merge

13. Pivot Table & Chart

- Creating Pivot Tables and Pivot Charts
- Manipulating A Pivot Table
- Changing Calculated Value Fields
- Sorting & Filtering Pivot Table Data

14. Lookup Functions

- The Horizontal Lookup & Vertical Lookup Functions
- Using If, And & Or Functions
- Index, Match & Offsetting Functions

Web References

4. <https://support.microsoft.com/en-us/office/analyze-data-in-excel-3223aab8-f543-4fda-85ed-76bb0295ffc4>
5. <https://www.youtube.com/watch?v=iG6lN9aBrcM>
6. <https://www.youtube.com/watch?v=GccwaO3NU0g>

Pedagogy

PowerPoint Presentation, Discussion, Demonstration and Practical Session.

Course Designer

Dr.Lakshna Arun, Associate Professor, Department of Computer Applications.

ALLIED COURSES - B.Com CA

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23UCC2CC4	Web Design	CORE	6	5

Course Objectives

- To introduce the realm of web design
- To impart theoretical knowledge in designing web page using HTML5 and CSS

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, the students will be able to	
CO1	Define the basic concepts of web design	K1
CO2	Illustrate the components of web design	K2
CO3	Identify the different type of tags to create web pages	K3
CO4	Apply the theoretical knowledge to develop websites	K4
CO5	Construct basic websites using HTML5 and Cascading Style Sheets	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	1	1	2	2	2	3	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	3	2	3	3
CO4	3	2	3	2	2	2	2	2	3	3
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Getting Started with HTML5: Introduction to HTML5 – Defining HTML Markup – Basic Structure of an HTML – Modifying the Background of an HTML Web Page – Specifying Metadata about an HTML Web Page – Introduction to New Elements in HTML5: The Markup Elements – The Media Elements – The Canva Element – The Form Element – The Input Type Attribute Values – The New Attributes – The New Event Attributes – The Window Event Attributes – The Form Events – The Mouse Events – The Media Events	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Working with Text: Adding Plain Text to an HTML Web Page – Adding Text in New Line – Creating Headings on a Web Page – Creating Paragraph – Creating Horizontal Rule – Creating Subscript and Superscript – Aligning the Text – Grouping the Text – Indenting Quotations – Working with Character Entities. Lists: Working with Lists – Nested Lists	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Tables: Creating a Table – Table caption – Adding a Table Heading – Table Border – Aligning Table and Cell Content – Table width and Column Width - Changing Background – Cell Padding – Cell Spacing – Spanning Rows and Columns – Nesting Tables Frames: Creating a Frame – Defining a new Element with Specific Attributes – Height and Width of Frame – Hyperlinks to Frames	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Hyperlinks, Images ang Multimedia: Working with Hyperlinks – Working with Images – Creating Image Maps – Working with Multimedia. Forms and Controls: Creating an HTML Form – Specifying the Action URL and The Method to Send the Form – Adding Controls to an HTML Form – Understanding New Form Elements – Grouping the Controls of HTML Forms – Specifying a Label for a Control	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	Working with Cascading Style Sheets: Understanding Style Sheets – Working with Styles – Working with Background Properties – Working with Text Properties – Working with List Properties – Working with HTML Element Box Properties – Working with Positioning and Block Properties	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	UNIT VI - Self Study for Enrichment (Not to be included for External Examination) Introduction to Internet –World Wide Web (WWW) – Web Page – Hyper Text – Net Surfing – Internet/Web Browsing – Browser – Internet Addressing – IP Address – Domain Name – Electronic Mail – Uniform Resource Locator (URL) – Internet Protocols – TCP/IP – FTP – HTTP.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

1. DT Editorial Services. (2015). HTML 5 in Simple Steps, 2nd Edition, Dreamtech Press New Delhi.

References

1. Mike McGrath. (2017). HTML 5 in Easy Steps, 2nd Edition, In Easy Steps Limited.
2. Ben Frain. (2020) Responsive Web Design with HTML5 and CSS, 3rd Edition, Packt Publishing Ltd. UK.

Web References

1. <https://www.tutorialspoint.com/html5/index.htm>
2. <https://www.javatpoint.com/html5-tutorial>
3. <https://www.w3schools.com/html/>

Pedagogy

Chalk and Talk, Power Point Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications.

Semester II	Internal Mark: 40			External Mark: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS	
23UCC2AC2P	HTML (P)	ALLIED	4	3	

Course Objective

- To impart practical knowledge in designing web page using HTML5 and CSS

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define the basic concepts of web design	K1
CO2	Illustrate the components of web design	K2
CO3	Identify the different type of tags to create web pages	K3
CO4	Apply the practical knowledge to develop websites	K4
CO5	Construct basic websites using HTML5 and Cascading Style Sheets	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	1	1	2	2	3	3	2
CO2	3	2	3	1	1	3	3	3	3	2
CO3	3	3	3	2	2	3	3	3	3	3
CO4	3	2	3	2	2	2	2	3	3	3
CO5	3	3	3	2	2	3	3	3	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

List of Practical

1. Creating a Webpage Layout using Semantic elements
2. Example for Audio element
3. Example for Video element
4. Creating a Registration form with validation
5. Drawing 2D graphics using Canvas
6. Example for LocalStorage
7. Example for Drag and Drop
8. Rose bud using Canvas
9. Animation using Canvas
10. Creating a Webpage using CSS

Web References

1. <https://tutorial.techaltum.com/html5.html>
2. http://www.makeitsimple.co.in/HTML5_programs.php
3. <https://www.tutorialspoint.com/html5/index.htm>
4. <https://www.javatpoint.com/html5-tutorial>

Pedagogy

PowerPoint Presentation, Demonstration, Discussion and Practical Session.

Course Designer

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications.

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCC4CC1P	Database Management Systems (P)	CORE	5	5

Course Objective

- To provide in depth programming knowledge in MySQL

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements	Cognitive Level
CO1	Recall DDL and DML Commands	K1
CO2	Apply Consistency Constrains on the table	K3
CO3	Compute Aggregate Functions	K2
CO4	Implement Logical and String Operations	K3
CO5	Execute Join Operations in SQL Queries	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	2	1	3	2	2	3	3
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

List of Practical

- Create a table and perform the following DDL operations
 - Set the primary key
 - Alter the structure of the table
 - Drop the table
- Create a table and perform the following DML operations
 - Insert values
 - Update and Delete records based on constraints

- c) Display values using various forms of select clause
- 3. Develop MySQL queries to implement the following Constraints on the table
 - a) Primary Key
 - b) Foreign Key
 - c) NOT NULL
- 4. Develop MySQL queries to implement the following Logical Operations
 - a) AND
 - b) OR
 - c) NOT
- 5. Develop MySQL queries to implement the Aggregate Functions
- 6. Develop MySQL queries to implement the String Operations using % and “_”
- 7. Develop MySQL queries to implement the SET Operations
- 8. Develop mysql queries to implement following join operations
 - a) Natural join
 - b) Inner join
 - c) Outer join
- 9. Develop MySQL queries to implement the following View Operations
 - a) Create View
 - b) Update View
 - c) Drop View

Web References

- 9. <https://dev.mysql.com/doc/mysql-tutorial-excerpt/8.0/en/examples.html>
- 10. <https://www.geeksforgeeks.org/mysql-common-mysql-queries/>

Pedagogy

Power Point Presentation, Demonstration, Discussion and Practical Sessions.

Course Designer

Dr. R. Brendha, Associate Professor, Department of Computer Applications.

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCC5CC9	R Programming	CORE	5	5

Course Objective

- To impart knowledge in fundamentals of R using Data Analysis.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the essential concepts of R programming	K1
CO2	Illustrate the components of R program	K2
CO3	Analyse the data using various built-in functions	K3
CO4	Apply programming knowledge to develop programs	K4
CO5	Solve real time problems using graphical plots	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	3	3	2	3	3	3	2	3	3
CO5	3	3	2	2	2	3	2	2	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Getting Started: Understanding R – Exploring Rstudio – Setting preferences – Creating an R script. Storing Values: Storing a single value – Adding comments – Recognizing data types – Storing multiple values – Storing mixed data types – Plotting stored values – Controlling objects.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Performing Operation: Doing arithmetic – Making comparisons – Assessing logic – Operating on elements – Comparing elements – Manipulating elements. Testing Conditions: Seeking truth – Branching alternatives – Chaining branches – Switching branches – Looping while true – Performing for loops – Breaking from loops.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Employing Functions: Doing mathematics – Manipulating strings – Producing sequences – Generating random numbers – Extracting statistics – Creating functions – Providing defaults. Building Matrices: Building matrix – Transposing data – Binding vectors – Naming rows and columns – Plotting matrices – Adding labels – Extracting matrix subsets – Maintaining dimensions.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Constructing data frames: Constructing a data frame – Importing data sets – Examining data frames – Addressing frame data – Extracting frame subsets – Filtering data frames – Merging data frames – Adjusting factors. Producing Quick Plots: Scattering points – Smoothing lines – Portraying stature – Depicting groups – Adding labels – Drawing columns – Understanding histograms – Producing histograms – Understanding box plots – Producing box plots.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Storytelling with Data: Presenting data – Considering aesthetics – Using geometries – Showing statistics – Illustrating facets – Controlling coordinates – Designing themes. Plotting perfection: Loading the data – Retaining objects – Overriding labels – Adding a theme – Restoring the workspace – Comparing boxes – Identifying extremes – Displaying facets – Exporting graphics – Presenting analyses.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for External Examination) Installing R – Installing Rstudio – Recognizing precedence – Distributing patterns – Changing frame columns – Installing packages – Limiting focus	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

2. Mike McGrath (2018). R for Data Analysis in easy steps, In Easy Steps Limited.

References

1. Dr. Mark Gardener (2012). Beginning R the Statistical Programming Language, John Wiley & Sons, Inc.
2. Jafed P.Lander (2015). R for Every One, 2nd Edition Person Education.

Web References

1. <https://www.r-project.org/about.html>
2. <https://www.datacamp.com/community/tutorials/r-or-python-for-data-analysis>
3. https://lgatto.github.io/2017_11_09_Rcourse_Jena/index.html

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications.

Semester V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UCC5CC2P	R Programming (P)	CORE	5	5

Course Objective

- To impart practical knowledge of R using Data Analysis.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the essential concepts of R programming	K1
CO2	Illustrate the components of R program	K2
CO3	Analyse the data using various built-in functions	K3
CO4	Apply programming knowledge to develop programs	K4
CO5	Solve real time problems using graphical plots	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	3	3	2	3	3	3	2	3	3
CO5	3	3	2	2	2	3	2	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

List of Practical

1. Simple Program.
2. Conditional Statements.
3. Looping Statements.
4. Function.
5. Vector.
6. Matrix.
7. Data Frame.
8. Barplot.

9. Pieplot.
10. Histogram.
11. Boxplot.
12. Quickplot

Web References

4. <https://www.w3resource.com/r-programming-exercises/basic/index.php>
5. <https://www.geeksforgeeks.org/r-programming-exercises-practice-questions-and-solutions/>
6. https://www.w3schools.com/r/r_examples.asp

Pedagogy

PowerPoint Presentation, Demonstration, Discussion and Practical Session.

Course Designer

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications.

ANNEXURE L



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED (IICYCLE) WITH “A” GRADE BY NAAC
ISO 9001:2015 Certified TIRUCHIRAPPALLI
PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

Department of Information Technology

(For the Candidates admitted from the Academic year 2022-2023 onwards)

PO NO.	Programme Outcome
	On completion of BSc-IT Programme, The students will be able to
PO 1	Academic Skills & Social Responsibility Apply Computing, Mathematical and Scientific knowledge in various disciplines by understanding the concerns of the society.
PO 2	Critical Thinking and Innovative Progress Design the software applications with varying intricacies using programming languages for innovative learning in techno world to meet the changing demands.
PO 3	Personality Development Perceive Leadership skills to accomplish a common goal with effective communication and understanding of professional, ethical, and social responsibilities.
PO 4	Lifelong Learning Identify resources for Professional development and apply the skills and tools necessary for computing practice to gain real life experiences.
PO 5	Creativity and Holistic Approach Create a Scientific temperament and novelties of ideas to support research and development in Computer Science to uphold scientific integrity and objectivity.

PSO NO	Programme Specific Outcomes Students of B.Sc information Technology will be able to	POs Addressed
PSO1	To apply the knowledge of Science and Computing in Information Technology	PO1
PSO2	Analyze the local and global impact of computing on individuals, organizations, society and implant lifelong learning for professional development	PO4
PSO3	Improve the capability to apply the knowledge in interrelated domains and solve real world problems with modern technological tools	PO2
PSO4	To strengthen the academic quality, effective communication, good ethics and responsibilities during professional practice	PO5
PSO5	Excel in job oriented skills which are required to meet the current demand in the field of IT industry and to become an entrepreneur with confidence	PO3



Cauvery College for Women (Autonomous)
Department of Information Technology
B.Sc Information Technology

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

IV	I	Language Course IV(LC)	பண்டைய இலக்கியமும் உரைநடையும்	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French – II	22ULF4						
	II	English Language Course - IV(ELC)	Learning Grammar Through Literature-II	22UE4	6	3	3	25	75	100
	III	Core Course – V(CC)	Programming in JAVA	22UIT4CC5	6	6	3	25	75	100
		Core Practical - IV(CP)	Programming in JAVA(P)	22UIT4CC4P	4	4	3	40	60	100
		Second Allied Course-III(AC)	Business Communication	22UIT4AC6	4	3	3	25	75	100
		Internship	Internship	22UIT4INT		2	-	-	-	100
	IV	Generic Elective Course II-(GEC)	Web Design (P)	22UIT4GEC2P	2	2	3	40	60	100
			Basic Tamil - II	22ULC4BT2				25	75	
			Special Tamil - II	22ULC4ST2						
		Skill Enhancement Course – I(SEC)	PC Packages (P)	22UIT4SEC1P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM	As per UGC Recommendation						
	Total				30	25				800
V	III	Core Course – VI(CC)	Operating Systems	22UIT5CC6	6	6	3	25	75	100
		Core Course - VII(CC)	Programming in Python	22UIT5CC7	6	6	3	25	75	100
		Core Practical – V(CP)	Programming in Python (P)	22UIT5CC5P	4	4	3	40	60	100
		Core Course – VIII(CC)	Software Engineering	22UIT5CC8	5	5	3	25	75	100
		Discipline Specific Elective – I(DSE)	A) Mobile Application Development	22UIT5DSE1A	5	4	3	25	75	100
			B) Big Data Analytics	22UIT5DSE1B						
			C) Cloud Computing	22UIT5DSE1C						
	IV	Ability Enhancement Compulsory Course-IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II(SEC)	Cloud Computing (P)	22UIT5SEC2P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM	As per UGC Recommendation						
	Total				30	29				700

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT4CC5	PROGRAMMING IN JAVA	CORE	6	6

Course Objectives

- To develop logics which will help them to create programs
- To get a deep knowledge of programming using JAVA language
- To understand the basics of OOPs concepts
- Enhance problem solving skill

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Identify the basic elements of Java programming, principles of OOP and graphical user interface.	K1
CO2	Infer the program structure, syntax and semantics of the programming language and interactive environment.	K2
CO3	Analyze the variables, data types, OOPs concept, AWT package and database.	K4
CO4	Use the programming skills in OOPs, GUI programming and database connectivity in various domains.	K3
CO5	Solve the real time problems using object-oriented concepts, interactive environment and JDBC connectivity	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	2	2	2	2	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	3	2	2	2
CO4	2	2	3	2	2	2	3	2	2	2
CO5	2	3	2	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamentals of Object-Oriented Programming: Basic Concepts of Object-Oriented Programming - Benefits and Applications of OOP. Java Evolution: Java Features - Java Environment - Overview of Java Language: Java Program Structures, Statements – Implementing A Java Program – Java Virtual Machine –. Constants, Variables and Data Types: Constants- Variables – Data Types – Declaration of Variables – Giving Values to Variables – Scope of Variables – Symbolic Constants- Type Casting- Getting Values of Variables.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Operators and Expressions - Decision Making and Branching: Introduction - Decision making with if statement-Simple if statement -The if ..else Statement-Nesting of if ...else statements- The switch statement - The Conditional Operator(?:Operator) - Decision Making and Looping : While, Do, For Statement, Jump In Loops, Return Statement.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Classes, Objects and Methods: Defining A Class – Fields and Methods Declaration - Creating Objects – Accessing Class Members – Constructors – Method Overloading – Static Members – Nesting of Methods – Inheritance: Extending A Class – Overriding Methods – Final Variables, Methods and Classes – Abstract Methods and Classes – Visibility Control. Arrays, Strings: Creating Arrays – One- and two-Dimensional Arrays - Strings. Interfaces: Multiple Inheritance: Introduction - Defining Interfaces - Extending Interfaces-Implementation Interfaces - Accessing Interfaces Variables.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Packages: Introduction - Java Packages - Using System Packages- Naming conventions - Creating packages - Accessing a package - Using a Package - Adding a class to a package - Multithreaded Programming: Creating Threads – Extending the Thread Class – Thread- Life Cycle of Thread-Using Thread Method-Thread Priority – Synchronization – Managing Errors and Exceptions: Introduction - Types of Errors -Exceptions-Syntax of Exception Handling - Multiple Catch Statements.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Graphics Programming using AWT, Swing and Layout Manager: The Graphics Class- Lines and Rectangles- Circles and Ellipses-Drawing Arcs - Drawing Polygons – Introduction to AWT Package – Window Fundamentals – Layout Managers – Introduction to Swing Package – Components and Containers - Database Connectivity: Introduction – JDBC Architecture – Discussion with Example – Overview of JDBC Components.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

VI	Self Study for Enrichment	-		
	(Not to be included for External Examination)			
	Comment Line Arguments – Enumerated Types - Finalizer		CO1	K1
	Methods - Applet Programming: Building Applet Code -		CO2	K2
	Applet Life Cycle - Creating and Executable Applet –		CO3	K3
	Designing a Web Page using Applet – Managing Input/Output Files in Java: Stream Classes – Byte Stream		CO4	K4
	Classes – Character Stream Classes – Creation of Files –		CO5	K5
	Reading/Writing Characters – Reading/Writing bytes.			

Text Book

E. Balagurusamy,(2019). ”*Programming with JAVA*”, 6th Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi.

Reference Books

1. S.Sagayaraj, R.Denis, P.Karthik and D.Gajalakshmi,(2017).“*Java programming*”, Universities Press.
2. Herbert Schildt, (2011).“*Java :The Complete Reference*”, 8th Edition Tata McGraw-Hill.
3. C.Muthu, (2008).”*Programming with JAVA*”, Second Edition, McGraw Hill Education
4. Ken Arnold gosling and Davis Holmen, (2005). ”*The JAVA Programming Language*”,4th Edition, Addison Wesley Pearson Education Publication.

Web References

1. <https://www.javatpoint.com/java-tutorial>
2. <https://www.guru99.com/java-tutorial.html>
3. <https://www.w3schools.com/java/>

NPTEL Online Courses

https://onlinecourses.nptel.ac.in/noc22_cs47/preview

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. A. BHUVANESWARI, Associate Professor, Department of Information Technology.

Semester II	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UIT4CC4P	PROGRAMMING IN JAVA(P)	CORE	4	4

Course Objective

- To demonstrate the basic programming components of Java
- To learn how to apply the object oriented concepts in Java to develop stand-alone applications
- To design and develop GUI applications with appropriate database connectivity

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Demonstrate and implement the fundamentals of Java programming concepts	K2, K3
CO2	Analyze the problem and develop skills on identifying appropriate programming constructs like looping, branching and functions	K3, K4
CO3	Examine the problem and create a reusable program by combining the features of Java such as Classes, Objects, Packages, Interfaces and Exception handling	K4, K6
CO4	Analyze the complexity of problem in real world and design an event driven and web based interactive programs using swing	K4, K6
CO5	Build applications with database connectivity to mimic the real world scenarios	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	3	2	3	1	2	3
CO2	3	2	3	1	3	3	3	1	3	2
CO3	2	3	3	2	2	2	3	2	2	2
CO4	2	2	3	2	2	3	3	2	3	2
CO5	3	2	2	2	2	3	2	1	2	3

"1"-Slight (Low) Correlation

"2"-Moderate (Medium) Correlation

"3"-Substantial (High) Correlation

"-"-indicates there is no Correlation.

Exercises:

1. Class and Objects
2. Constructor Overloading
3. Inheritance
4. String Manipulation
5. Interface
6. Package
7. Multithread
8. Exception Handling
9. GUI using Swing
10. Database Connectivity using JDBC

Web References:

1. <http://docs.oracle.com/javase/tutorial/java/>
2. <http://www.java2s.com/Tutorial/Java/CatalogJava.htm>
3. <http://www.javatpoint.com/java-swing>
4. <http://way2java.com/java-versions-2/jdk-1-8-features/>
5. <https://www.w3schools.com/java/>
6. <https://www.tutorialspoint.com/java/>

Pedagogy:

Power Point Presentations, Demo by Virtual Labs, e-Contents tutorials

Course Designer:

Dr. A. BHUVANESWARI, Associate Professor, Department of Information Technology.

Semester - IV	Internal Marks: 40		External Marks: 60	
Course Code	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT4GEC2P	WEB DESIGN (P)	Generic Elective Course- II (GEC)	2	2

OBJECTIVE

To get familiar with commands of HTML

To develop a web page with Table, Frames and Links

To create a form with user interaction

To handle embedding audio and video in HTML

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Develop a simple web page using basic HTML tags	K1
CO2	Create many frames and link them in HTML	K2
CO3	Design a web page using Tables	K3
CO4	Embed audio and video in HTML	K4
CO5	Recommend a form with user interaction	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	2	2	2	2	1	1
CO2	3	3	2	3	3	2	3	2	2	2
CO3	3	2	3	2	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3

“1” - Slight (Low) Correlation

“3” - Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” – Indicates there is no Correlation

SYLLABUS

1. Handling different tags available in HTML
2. Create an advertisement in HTML with images and link multiple documents
3. Prepare a Time Table for your class using TABLE tag
4. Create a number of framesets and jump to a specific section within a frame
5. Develop a web page using different types of lists in HTML
6. Embedding audio and video in HTML documents
7. Create an application form for a job (use Text box, Check box, Buttons...)

Web References:

1. <https://www.w3schools.com/tags/default.asp>
2. <https://webreference.com/html/>
3. <https://www.geeksforgeeks.org/programming-for-beginners-10-best-html-coding-practices-you-must-know/>
4. <https://www.codecademy.com/learn/learn-html>

Course Designer:

Dr. S.LATHA

Semester - IV	Internal Marks: 40		External Marks: 60	
Course Code	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT4SEC1P	PC Packages (P)	Skill Enhancement Course-I (SEC)	2	2

OBJECTIVE

- To implement various features of MS word
- To learn about MS Excel and its various Applications
- To create e-content using power point presentation

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Show various formatting operations in MSWord	K1
CO2	Create multiple documents using Mail merge	K2
CO3	Design a table and implement various operations	K2
CO4	Apply various operation and charts in MS-Excel	K3
CO5	Make use of power point features to create E content	K3

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	2	2	2	2	1	1
CO2	3	3	2	3	3	2	3	2	2	2
CO3	3	2	3	2	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3

“1” - Slight (Low) Correlation

“3” - Substantial (High) Correlation

“2” - Moderate (Medium) Correlation

“-” – Indicates there is no Correlation

SYLLABUS

MS Word

1.Create a document and perform the following operations.

To count the occurrences of the word,find and replace a particular word, set the autocorrect entry and apply various formatting operations

2.Create student table and perform the operation such as Insertion,Deletion,alignment,splitting, merging of cells ,sorting and apply autosum formulas.

3.Use Mailmerge concept to create multiple letters

4.Create Table of contents,bibliography and bookmarks.

MS-Excel

1.Create a student table for five subjects

Compute the total marks and percentage of each student by entering the appropriate formula.

Compute the grades

Find the maximum and minimum percentage

Generate a column chart to compare data

2. A company records the details of total sales (in Rs.) sector wise and month wise

Using appropriate formula, calculate total sale for each sector

Create a 3-D column chart to show sector wise data for all four months

Create a 3-D pie chart to show sales in Jan in all sectors

3.Create employee paybill for two years with following details

To calculate the total salary as sum of Basic Salary, HRA and DA for each employee for the year 1997.

To calculate the total salary of each employee for the year 1998 as sum of salary for the year 1997 and bonus. Also calculate the percentage increase in the total salary from 1997 to 1998 for each employee.

Create a Bar chart to compare the two years

POWER POINT

1. Design a Birthday Invitation card with music.
2. Design a cover for a book a theme for the page, picture or clipart and Use WordArt
3. Design a poster with customized page set up inviting all students of your department to the IT Fest.
4. Create a 5-slide presentation on any topic. Use Images, Graphs, Chart, Tables, Animation, Time, Bullets, Transition, Sound, Hyperlink, Background template, Header and Footer.
5. Record Audio to the above presentation and convert it to video file

Web References

<https://www.javatpoint.com/ms-word-tutorial>

<https://www.tutorialspoint.com/mastering-microsoft-office-2021-365-word-excel-powerpoint/index.asp>

<https://www.oakland.edu/Assets/Oakland/grad/files-and-documents/Thesis-Dissertations/Microsoft-Office-Tutorials/Microsoft%20Office%20Tutorials.pdf>

Course Designer

1. Dr..S.Suguna Devi, Associate professor, Department of Information Technology

Semester V	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT5CC6 /22UCS5CC6	OPERATING SYSTEMS	CORE COURSE – (CC)	6	6

Course Objectives

- To understand the basic concepts of operating system
- To know the responsibilities of the operating system
- To get in depth knowledge of various scheduling algorithm for efficient resource management
- To acquire the knowledge of file management

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the conceptual view of Operating systems	K1
CO2	Comprehend how an operating system provides an abstracted interface to the hardware resources	K3
CO3	Apply various scheduling algorithms for efficient resource utilization.	K3
CO4	Analyze the role of synchronization to improve system performance	k4
CO5	Explore the architecture, features, and functionalities of various operating systems	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	2	3	3	1	3	3
CO2	3	3	2	3	3	3	3	1	3	2
CO3	3	3	3	2	3	2	2	3	2	3
CO4	3	2	2	3	3	3	2	2	3	3
CO5	3	3	2	3	3	3	3	2	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

Unit	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Operating System Overview: Operating System Objectives and Functions - Evolution of Operating Systems - Major Achievements Developments Leading to Modern Operating Systems- Microsoft windows overview- Linux – Linux VServer Virtual Machine Architecture	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Process: What Is a Process? - Process States: Creation and Termination of Processes - Five-State Model - Process Description: Operating System Control Structures- Process Control Structures - Process Control -Modes of Execution - Process Creation - Process Switching - Threads: Processes and Threads – Types of Threads – User Level and Kernel Level Thread	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Uniprocessor Scheduling: Types of Processor Scheduling - Scheduling Algorithms: Short-Term Scheduling Criteria - Use of Priorities - Alternative Scheduling Policies – Linux Scheduling – Windows Scheduling- Principles of Concurrency - Mutual Exclusion - Semaphores – Monitors: Monitor with Signal - Message Passing - Principles of Deadlock - Deadlock Prevention - Deadlock Avoidance Deadlock Detection Deadlock Detection – Unix, Linux, Windows7 Concurrency mechanism.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Memory Management Requirements - Memory Partitioning: Fixed Partitioning - Dynamic Partitioning - Relocation - Paging – Segmentation – Virtual Memory - Hardware and Control Structures -Locality and Virtual Memory - Paging – Segmentation - Combined Paging and Segmentation - Operating System Software: Fetch Policy - Placement Policy - Replacement Policy – Linux memory management – Windows memory management	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Disk Scheduling: Disk Performance Parameters - Disk Scheduling Policies – File Management: Overview - File Organization and Access - File Directories - File Sharing - Record Blocking - File System Security	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self-Study for Enrichment (Not included for End Semester Examinations) OS Design Considerations for Multiprocessor and Multicore – Windows, Unix and Linux Installation- 7 UNIX SVR4 Process Management, Buddy System, – Windows 7 Thread and SMP Management - Linux Process and Thread Management -Traditional UNIX Scheduling – Windows File system – Linux File system		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Textbook

1. Operating Systems Internals and Design Principles (2018), William Stallings, 9th Edition, Prentice Hall,

References

1. Andrew S.Tanenebaum (2011), Operating Systems and Design Implementation, 3rd Edition, Pearson Education
2. Abraham Silberschatz , Perter Baer Galvin, Greg, (2010), Operating System Concepts, 8th Edition John Wiley & Sons.
3. Rohit Khurana (2014), Operating Systems, 2nd Edition, Vikas Publishing House Ltd.

Web References

1. <https://www.geeksforgeeks.org/what-is-an-operating-system>
2. <https://www.gatevidyalay.com/operating-system/>
3. <https://www.javatpoint.com/operating-system>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designers

2. Dr. P. Tamilselvi, Associate professor, Department of Information Technology

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT5CC7	Programming in Python	CORE	6	6

Course Objectives

- To understand the fundamentals of Python programming
- To demonstrate the usage of Arrays, Functions, Input and Output statements
- To develop programs with GUI and Regular expressions
- To create files and handle Exceptions

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	To define the basics of Python	K1
CO2	To explain the data types, Arrays, Regular expressions and Functions in Python	K2
CO3	To interpret the usage of Operators, Decision making, Control statements and File handling in Python	K3
CO4	To analyze the importance of Exception Handling in Python	K4
CO5	To evaluate the usage of modules and packages in Python	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	3	3	2	2	2	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	2	2	3	2
CO4	3	2	3	2	1	3	3	2	3	2
CO5	3	3	3	1	2	2	3	2	2	3

"1" – Slight (Low) Correlation

"2" – Moderate (Medium) Correlation

"3" – Substantial (High) Correlation

"-" indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Python: Features of Python - How to run Python - Basics of Python - Input, Output and Import Functions – Operators – Data Types and Operations: Numbers – Strings – List – Tuple – Set – Dictionary – Mutable and Immutable Objects – Data Type Conversion - Flow Control: Decision Making – Loops – Nested Loops – Control Statements – Types of Loops – List, Set and Dictionary Comprehensions – Nested Dictionaries	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Arrays: Creating an Array – Indexing and Slicing – Types – Numpy arrays – Attributes of an Array – The reshape() Method – The Flatten Method() – Working with Multi-dimensional arrays – Indexing and slicing in multi-dimensional arrays – Matrices in Numpy – Random Numbers - Strings and Characters	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Functions: Function Definition and Calling – Function Arguments – Anonymous Functions – Recursive Functions – Function with more than one return value – Modules and Packages: Built-in Modules – Creating Modules – Import Statement – Locating Modules – Namespaces and Scope – The dir() function – The reload() function – Packages in Python – Date and Time Modules	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	File Handling: Opening, Closing, Writing, Renaming, Deleting and Reading from a File – File Methods – Directories in Python – Exceptions: Errors in a Python Program – Exceptions – Exception Handling – Types of Exceptions – The Except Block – The assert statement – User-Defined Exceptions – Logging the Exceptions	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Regular Expressions: The match() and search() function - Search and Replace – Regular Expressions Modifiers and Patterns – Character and Special Character Classes – Repetition Cases – findall() and compile() method – GUI Programming: Introduction – Tkinter - Widgets – Layout Managers	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

VI	Self-Study for Enrichment	-	CO1	K1
	(Not to be included for External Examination)		CO2	K2
	Function Decorators, Strings and characters, Features of OOPS, Data		CO3	K3
	Structures in Python and Networking in Python		CO4	K4
			CO5	K5

Text Books

1. Jeeva Jose, "Taming Python by Programming", 2019, Khanna Book Publishing Co. (P) Ltd
2. Dr. R. Nageswara Rao, "Core Python Programming", 2018, Dreamtech Press

Reference Books

1. Johannes Ernesti, Peter Kaiser "Python 3: The Comprehensive Guide", 2022, SAP Press
2. Sakis Kasampalis Quan Nguyen Dr Gabriele Lanaro Dr. Gabriele Lanaro "Advanced Python Programming", 2019, Packt

Weblinks and Video Lectures (e-Resources):

1. <https://www.youtube.com/watch?v=rfscVS0vtbw>
2. <https://www.youtube.com/watch?v=jcQnTwjItXM>
3. <https://www.youtube.com/watch?v=DmHSwTiD5Tk>
4. <https://www.youtube.com/watch?v=-uNayxaQoU>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. M. THANGAM, Associate Professor, Department of Information Technology

Semester V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT5CC5P	Programming in Python (P)	Core Practical	4	4

OBJECTIVES

- To understand and implement Python programs
- To inculcate hands-on experience in developing Python programs
- To perform file operations and exception handling in Python

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	COURSE STATEMENT	Knowledge Level
CO1	Develop simple programs in Python using data types and variables	K1
CO2	Demonstrate the concepts of Arrays, Functions and Strings	K2
CO3	Make use of Regular Expressions and Exception handling	K3
CO4	Analyze the usage of Files and its manipulations	K4
CO5	Evaluate the programs using GUI implementations	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	1	2	2	1
CO2	3	3	2	3	3	2	3	2	2	2
CO3	3	2	3	2	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3

“1” - Slight (Low) Correlation

“2” - Moderate (Medium) Correlation

“3” - Substantial (High) Correlation

“-” – Indicates there is no Correlation

LIST OF PRACTICAL

1. Simple programs in Python
2. Data types and Operations
3. Array Manipulations
4. Programs using Functions
5. Handling Strings
6. Programs using Lists, Tuples and Dictionaries
7. Executing Regular Expressions in Python
8. GUI programs
9. File Handling

Web References

1. <https://www.python.org/about/gettingstarted/>
2. <https://www.programiz.com/python-programming>
3. <https://www.w3schools.com/python/>
4. <https://www.geeksforgeeks.org/python-programming-language/>

Course Designer

Ms. M. THANGAM, Associate Professor, Department of Information Technology

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGOR Y	Hrs/Week	CREDITS
22UIT5CC8	SOFTWARE ENGINEERING	CORE	5	5

COURSE OBJECTIVES

- The course is intended to influence the knowledge on constructing reliable software products.
- It also highlights several software testing to improve the quality of the software.

COURSE OUTCOMES

The successful completion of the course will equip the students to

CO Number	CO Statement	Knowledge Level
CO1	Outline the progression in software and software engineering practice.	K1
CO2	Categorize the development phases and life cycle models of a project.	K2
CO3	Build the model in software project design and quality.	K3
CO4	Analyze the Software Engineering Process and types of testing	K4
CO5	Explain the Process Models, Design concepts and Testing approaches	K5

Mapping with Programme Outcomes

COs	PSO1	PSO2	PSO 3	PSO 4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	2	2	1	3	2
CO2	3	3	3	2	3	2	2	1	2	2
CO3	3	3	3	2	2	2	3	2	3	3
CO4	3	3	3	3	3	3	3	2	2	3
CO5	3	2	3	3	3	3	3	2	3	3

“1” - Slight (Low) Correlation

“2” - Moderate (Medium) Correlation

“3” - Substantial (High) Correlation

“-” – Indicates there is no Correlation

SYLLABUS

Unit	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Software and Software Engineering: The Nature of Software - The Unique Nature of WebApps – Software Engineering – The Software Process - Software engineering practice - Software myth	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	The Software Process: Process Models: Generic process model- Prescriptive process models Requirements Modeling - Requirements Analysis: Requirement Modeling Approaches – Data Modeling concepts - Class based modeling -Flow Oriented Modeling	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Design concepts: Design within the context of software engineering - The Design Process - Design Concepts - The Design model – Component Level Design: Designing Class-Based Components- Quality concepts- What is Quality? - Software Quality: McCall's Quality Factors - Achieving Software Quality	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Testing Approaches: Software Testing Fundamentals - Types of Testing: White Box Testing - Static Testing- Structural Testing - Black Box Testing: What is Black Box testing – How to do? Integration Testing: Integration Testing- Integration Testing as Type of Testing. System and Acceptance Testing: System Testing Overview- Functional testing versus Non-functional Testing-Functional testing - Non-functional Testing – Acceptance Testing	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Performance Testing: Factors governing Performance testing- Regression Testing: What is Regression testing- Types of Regression Testing - Best Practices in Regression Testing. Internationalization Testing: Primer on Internationalization - Test Phase for Internationalization – Internationalization Validation – Fake Language Testing – Language Testing – Localization Testing - Ad-hoc Testing: Overview – Buddy Testing – Pair Testing - Exploratory Testing – Iterative Testing – Defect Seeding.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Semester V		Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS	
22UIT5DSE1A	Mobile Application Development	Discipline Specific Elective – I (DSE)	5	4	
VI	Self-Study for Enrichment		CO1	K1	
	(Not included for End Semester Examinations)		CO2	K2	
	Agile Process and Agile Process Models –		CO3	K3	
	Requirements modelling for Web Apps –		CO4	K4	
	Testing Web Applications.		CO5	K5	

Textbook

1. Roger S. Pressman, 2010, Software Engineering: A Practitioner's Approach, 7th Edition , McGraw-Hill Education **(Unit 1,2,3)**
2. Srinivasan Desikan, Gopalaswamy Ramesh (2012), Software Testing Principles and Practices, Pearson Education. **(Unit 4,5)**

References

1. Ian Sommerville (2010), Software Engineering, 7th Edition, Pearson Education
2. Paul C. Jorgensen (2010), Software Testing: A Craftsman's Approach, Fourth Edition, 4th Edition Auerbach Publications.
3. Naresh Chauhan (2012), Software Testing- Principles and Practices, Oxford University Press

Web References

1. <https://scai.engineering.asu.edu/wp-content/uploads/sites/31/2022/10/22-23-SoftwareEngineeringHandbookPublish.pdf>,
2. <https://www.open.edu/openlearn/science-maths-technology/approaches-software-development/content-section---references>
3. <https://www.tutorialspoint.com/software-testing-complete-reference/index.asp>
4. <https://www.javatpoint.com/software-testing-tools>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

1. Dr. S. Latha, Associate Professor, Department of Information Technology.

COURSE OBJECTIVES

This course explores the knowledge over Mobile Application Development with its framework, layouts, intents and database connectivity.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Choose the development framework and the need for mobile applications	K1
CO2	Demonstrate the activity and intent usage	K2
CO3	Design applications with intents and broadcast receivers.	K3
CO4	Compile an application with database connectivity	K4
CO5	Develop real time applications to improvise user experience	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO2	PO 3	PO4
CO1	2	3	2	1	1	2	2	2	2
CO2	3	2	3	1	1	3	3	2	3
CO3	3	3	3	2	2	3	3	2	3
CO4	3	2	3	2	2	3	3	2	3
CO5	3	3	3	2	2	3	3	2	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Getting Started with Android Programming Introduction to Android – Obtaining the Required Tools – Launching your First Android Application - Using Android Studio for Android Development – Activities, Fragments and Intents.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Getting to Know the Android User Interface Understanding the Components of a Screen – Designing User Interface with Views: Basic Views – Displaying Pictures and Menus with Views.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Semester V		Internal Marks: 25			External Marks: 75	
COURSE CODE		COURSE TITLE	CATEGORY	Hrs/Week	CREDITS	
22UIT5DSE1B		B.Big Data Analytics	Discipline Specific Elective – I(DSE)	5	4	
III	Data Persistence and Content Providers Saving and Loading User Preferences – Persisting Data to Files – Creating and Using Databases. Content Providers: Sharing Data in Android – Using a Content Provider.		15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5	
IV	Messaging and Location Based Services Messaging: SMS Messaging – Sending Email. Location Based Services: Displaying Maps – Getting Location Data - Monitoring Location		15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5	
V	Networking and Developing Android Services Networking: Developing Android Services: Creating your own services - Establishing Communication between a Service and an Activity - Binding Activities to Services – Understanding Threading.		15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5	
VI	Self Study for Enrichment (Not to be included for External Examination) Develop a App for maintaining the Home security Develop an App to monitor the health related activity of an individual Create a Tutorial mobile app for a subject		-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5	

TEXT BOOK:

J. E. DiMarzio(2017),”Beginning Android Programming with Android Studio”,4th Edition, John Wiley & Sons

Reference Books

1. Reto Meier(2012),”Professional Android Application Development”,Wiley
2. Charlie Collins, Michael Galpin and Matthias Kappler((2012),”Android in Practice”, DreamTech

<http://developer.android.com/develop/index.html>

Web References

<https://www.tutorialspoint.com/android/index.htm>

<https://www.geeksforgeeks.org/android-tutorial/>

<https://www.javatpoint.com/android-tutorial>

Course Designers

Dr. S.Suguna Devi, Associate professor, Department of Information Technology

Course Objectives

- Understand the Big Data Platform and its Use cases
- Provide an overview of Apache Hadoop
- Understand Map Reduce Jobs
- Provide hands on Hadoop Eco System
- Apply analytics on Structured, Unstructured Data

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Identify Big Data and its Business Implications	K1
CO2	List the components of Hadoop and Hadoop Eco-System	K2
CO3	Access and Process Data on Distributed File System	K3
CO4	Manage Job Execution in Hadoop Environment	K4
CO5	Develop Big Data Solutions using Hadoop Eco System	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	3	3	2	2	2	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	2	2	3	2
CO4	3	2	3	2	1	3	3	2	3	2
CO5	3	3	3	1	2	2	3	2	2	3

"1" – Slight (Low) Correlation

"2" – Moderate

(Medium) Correlation "3" – Substantial (High) Correlation

"-"

indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Big data analytics: Need of Big data-Classification of Data - Structures, Semi-structured and unstructured - Big data definitions - Characteristics-Data type - Big data Classifications - Big data handling techniques - Defining data architecture-Data Sources, Quality, Preprocessing and storing- Data storage and analysis – Big data analytics applications and case studies.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Hadoop: Hadoop and its ecosystem-Hadoop distributed File system – Map reduce Framework and Programming model - Hadoop YARN-Hadoop ecosystem tools.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	NoSQL Big data Management: NoSQL datastore -NoSQL data Architecture patterns - NoSQL to manage Big data – shared – Nothing Architecture for big data tasks- MongoDB Database-Cassandra databases.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	MapReduce , Hive and Pig : MapReduce, Map tasks, Reduce Tasks and MapReduce execution - Composing MapReduce for calculations and algorithms -HIVE - HIVEQL - Pig	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Spark and Big data Analytics: Spark-Introduction to data analytics with Spark - Downloading Spark and programming using RDDs and MLIB – Data ETL – Introduction to analytics, Reporting and visualizing	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self Study for Enrichment(Not to be included for External Examination) Programming Examples in Analytics and Machine Learning using Hadoop, Spark and Python : Installation Steps for Hadoop and Spark - Installation Steps for Hadoop, Hive and Pig - Installation Steps for the Spark on Ubuntu - Computing Platform Configuration - Datasets Used in the Examples, Data Deployment and Exploration - Counting and Sorting of Items in Datasets using MapReduce - Storing CSV Dataset into Hive Database Storing CSV Dataset into the Spark DataFrame -Merge and Join Functions for DataFrame Objects - Analysis and Query-Processing Using UDFs in Hive and Pyspark - Data Visualization using Python Plotting Library	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Text Book

Raj Kamal, Preeti Saxena(2019),” Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning”, McGraw-Hill Education

Reference Books

1. Tom White(2015), “Hadoop: The Definitive Guide”, 4 th Edition, O’Reilly Media, ISBN-13: 978-9352130672
2. Boris Lublinsky, Kevin T Smith, Alexey Yakubovich, "Professional Hadoop Solutions", 1st Edition, Wrox Press, 2014 ISBN-13: 978-8126551071
3. Eric Sammer(2012), "Hadoop Operations: A Guide for Developers and Administrators", 1st Edition, O'Reilly Media,.ISBN-13: 978-9350239261
4. Arshdeep Bahga(2018), Vijay Madisetti, "Big Data Analytics: A Hands-On Approach", 1st Edition, VPT Publications, 2018. ISBN-13: 978-0996025577

Weblinks and Video Lectures (e-Resources):

1. https://www.youtube.com/watch?v=n_Krer6YWY4
2. https://onlinecourses.nptel.ac.in/noc20_cs92/preview
3. <https://www.digimat.in/nptel/courses/video/106104189/L01.html>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. J. SANGEETHA, Associate Professor, Department of Information Technology.

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT5DSE1C	Cloud Computing	Discipline Specific Elective – I (DSE)	5	4

Course Objectives

- To learn about the basic concepts in Cloud Computing
- To know about Cloud infrastructure mechanisms and cloud service management
- To describe the cloud computing architecture design principles
- To understand the role of virtualization in building an efficient cloud architecture
- To identify and discuss cloud security threats

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome	Cognitive Level
CO1	To define the core concepts of cloud computing paradigm, characteristics, advantages, challenges and threats from various cloud computing models and services	K1
CO2	To identify the cloud computing, models, services, techniques and applications with different cloud architectures	K2
CO3	To apply the fundamental concepts of Virtualization in cloud and discuss its types and usage with different cloud models and services	K3
CO4	To analyze the performance of cloud computing with cloud security issues in recent technologies and platforms	K4
CO5	To summarize the importance of cloud computing models, services, usage of virtualization with cloud security issues	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	3	3	2	2	2	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	2	2	3	2
CO4	3	2	3	2	1	3	3	2	3	2
CO5	3	3	3	1	2	2	3	2	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation
Correlation

“-” indicates there is no

SYLLABUS

UNIT	CONTENT	HRS	COs	COGNITIVE LEVEL
I	Foundation of Cloud Computing: Introduction – History – Fundamentals of Cloud Computing Ecosystem – Cloud computing characteristics – Advantages and disadvantages of cloud computing – Comparison of traditional and cloud computing paradigms – Cloud Services and Deployment Models: Cloud Deployment Models – Cloud Service Models – Cloud infrastructure mechanisms – Cloud Service Management	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Cloud Computing Architecture: Design principles – Cloud Computing Life Cycle (CLCC) – Cloud Computing Reference Architecture – Load balancing approach – Mobile Cloud Computing (MCC) – Virtualization Technology – Understanding and adopting Virtualization – Techniques of Virtualization – How virtualization works? – XEN, Kernel-based Virtual Machine (KVM), VMware, VirtualBox, Citrix – Types of Virtualization – Virtualization in Cloud	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Cloud Security and Privacy: Cloud Security – Cloud CIA security model – Cloud computing security architecture – Data Security in the Cloud: Challenges with Cloud Data – Data Confidentiality and Encryption – Data Availability – Data Integrity – Cloud Data Management Interface – Cloud Service Gateways (CSG) – Cloud Firewall – Virtual Firewall	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Cloud Computing Service Level Agreements and Applications: Service Level Agreements (SLA) practices – Components of a cloud SLA – Types of SLAs – Cloud Computing Applications: Introduction – Google App Engine – Google Apps – Google Cloud Datastore – Dropbox Cloud – Apple iCloud – Microsoft Windows Azure Cloud – Amazon Web Services (AWS)	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Cloud Computing Technologies, Platforms and Services: High Performance computing with cloud technologies – Message Passing Interface(MPI) – MapReduce programming model – Dryad and Dryad LINQ – Eucalyptus cloud platform and its components – Open Nebula cloud platform- Features and Layers – OpenStack cloud platform- components and benefits – Nimbus cloud computing platform and its features – Apache Hadoop ecosystem – Architecture and components – Hadoop and cloud	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self Study for Enrichment (Not to be included for External Examination) Security issues in virtualization – Service Oriented Architecture – Legal issues in cloud computing – Cloud computing certifications – Factors affecting cloud computing adoption	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Text Books

1. Kamal Kant Hiran, Ruchi Dish, Temitayo Fagbola, Mehul Mahrishi, “**Cloud Computing**”, 2019, BPB Publications
2. Kailash Jayaswal, Jagannath Kallkurchi, Donald J. Houde, Dr. Deven Shah, “**Cloud Computing Black Book**”, 2015, DreamTech Press

Reference Books

1. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, “**Cloud Computing – A Practical Approach**”, McGraw Hill Education, 2017
2. Rajkumar Buyya, James Broberg, Andrzej Goscinski, “**Cloud Computing – Principles and Paradigms**”, 2013, Wiley Publications
3. Dan C. Marinescu, “**Cloud Computing – Theory and Practice**”, Second Edition, Elsevier, 2019

Weblinks and Video Lectures (e-Resources)

1. <https://k21academy.com/cloud-blogs/cloud-computing-deployment-models/>
2. <https://www.mygreatlearning.com/blog/virtualization-in-cloud-computing/>
3. <https://www.simplilearn.com/applications-of-cloud-computing-article>
4. <https://www.youtube.com/watch?v=-8O32k26RWA>
5. <https://www.youtube.com/watch?v=RWgW-CgdIk0>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar

Course Designer

Ms. M. THANGAM, Associate Professor, Department of Information Technology.

Semester V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT5SEC2P	Cloud Computing (P)	Skill Enhancement Course – II(SEC)	2	2

OBJECTIVE

- To install and create Virtual Machines in Workstation Player
- To apply the knowledge of how to Install and Upgrade VMware Tools
- To implement how to configure various Virtual Machine Hardware Settings
- To implement file transfer from host machines to guest machines

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	COURSE STATEMENT	Knowledge Level
CO1	Mention the steps to install and create Virtual Machines	K1
CO2	Demonstrate the workstation Player Preference settings	K2
CO3	Apply the knowledge to install, upgrade and configure on VMware tools	K3
CO4	Examine the knowledge on Virtual Machines	K4
CO5	Implement file transfer from host to guest machines	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	2	2	2	2	1	1
CO2	3	3	2	3	3	2	3	2	2	2
CO3	3	2	3	2	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3

“1” - Slight (Low) Correlation

“2” - Moderate (Medium) Correlation

“3” - Substantial (High) Correlation

“-” – Indicates there is no Correlation

LIST OF PRACTICAL

1. Creating Virtual Machines in Workstation Player
2. Changing Workstation Player Color Theme Settings
3. Installing and Upgrading VMware Tools
4. Configure VMware Tools Updates for a Specific Virtual Machine
5. Changing the Display Settings for a Virtual Machine
6. Change the Name, Working Directory, VM Directory and Memory Allocation for a Virtual Machine
7. Configuring and Managing devices like Keyboard, CD-ROM, Floppy Drives
8. Configuring Network Connections
9. Configuring Virtual Machine Hardware Settings
10. Implement File transfer from host to guest machines

Web Reference

1. <https://k21academy.com/cloud-blogs/cloud-computing-deployment-models/>
2. <https://www.mygreatlearning.com/blog/virtualization-in-cloud-computing/>
3. <https://www.simplilearn.com/applications-of-cloud-computing-article>

Course Designer

Ms. M. THANGAM, Associate Professor, Department of Information Technology.



Cauvery College for Women (Autonomous)

Department of Information Technology

B.Sc Information Technology

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2023-2024 and onwards)

2023-2024

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs	Marks		
								Int.	Ext	
II	I	Language Course-II(LC)	பொதுத்தமிழ் - II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar – II	22ULH2						
			Prose, Grammar and History of Sanskrit literature	23ULS2						
			Basic French – II	22ULF2						
	II	English Language Course- II(ELC)	General English-II	23UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Data Structures and Algorithms	23UIT2CC2	4	4	3	25	75	100
		Core Practical - II (CP)	Data Structures using C(P)	23UIT2CC2P	2	2	3	40	60	100
		Core Course-III(CC)	Digital Fundamentals	22UIT2CC3	4	4	3	75	25	100
		First Allied Course-III(AC)	Operations Research	22UIT2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II(AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Ability Enhancement Compulsory Course-III(AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
		Extra Credit Course	SWAYAM		As per UGC Recommendation					
	Total					30	22			

Semester II	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
23UIT2CC2	DATA STRUCTURES AND ALGORITHMS	CORE COURSE – II(CC)	4	4

Course Objectives

- To provide the knowledge of basic data structures and their implementations.
- To understand the importance of data structures in the context of writing efficient programs.
- To develop skills to apply appropriate data structures in problem solving.

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand the abstract data types and basics of Algorithms	K1
CO2	Demonstrate the performance of basic linear and nonlinear data structures	K2
CO3	Implement the basic data structures and algorithmic design techniques	K3
CO4	Analyze the efficiency of algorithms	K4
CO5	Assess, evaluate and choose appropriate data structure and algorithmic technique to solve the real-world problems	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	1	2	3	2	1	2	2
CO2	2	2	2	2	2	1	2	1	2	2
CO3	3	3	3	2	3	3	2	1	3	3
CO4	3	2	3	2	2	3	3	2	2	2
CO5	2	3	3	2	3	3	3	2	2	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction-Basic Terminology-Data Structures-Data Structures Operation-Abstract Data Types (ADT)- Algorithms: Complexity, Time-Space Tradeoff. Arrays: Representation of Arrays- Linear Arrays - Insertion – Deletion and Traversal of a Linear Array - Array as an Abstract Data Type.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Stacks: Array and Linked Representation of Stack-Prefix-Infix and Postfix Arithmetic Expressions-Conversion-Evaluation of Postfix Expressions. Queues: Definition-Linked Representation of Queue - The Queue Abstract Data Type-Circular Queues.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Linked list: Introduction- Linked Lists – Representation of Linked Lists in Memory – Traversing a Linked List – Searching a Linked List – Insertion into and Deletion from a Linked List. Trees: Introduction - Binary Trees – Representing Binary Trees in Memory - Binary Tree Traversals — Binary Search Tree – Searching, Inserting and Deleting in Binary Search Trees.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Sorting and Searching: Sorting: Introduction-Insertion Sort- Selection Sort – Merge Sort - Quick Sort. Searching: Linear Search- Binary Search	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Graphs: Introduction – Graph Theory Terminology – Sequential Representation of Graphs- Warshall’s Algorithm – Linked Representation of Graphs – Operations on Graph - Graph Traversals.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Multi Dimensional Array-Recursion - Traversal Algorithms using Stacks Deque- Bubble Sort– Topological Sort.	-	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Textbook

1.Data Structures with C, Seymour Lipschutz (Schaum's Outlines), 2011, McGraw Hill Education Pvt. Ltd.,

Reference Books

1. Ellis Horowitz, Sartaj Sahni and Susan and Rewson-Freed(2008), Fundamentals of Data Structures in C,2nd Edition, Universities Press

2. ISRD Group, (2009). Data Structures Using, Tata McGraw Hill Education Pvt. Ltd, New Delhi.

Web References

1. <https://www.geeksforgeeks.org/data-structures>
2. https://www.tutorialspoint.com/data_structures_algorithms/index.html
3. <https://ocw.mit.edu/courses/6-006-introduction-to-algorithms-spring-2020/>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

1. Dr. A. Bhuvaneswari, Associate Professor, Department of Information Technology.
2. Dr. P. TamilSelvi, Associate Professor, Department of Information Technology

Semester II	Internal Mark: 40		External Mark: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
23UIT2CC2P	DATA STRUCTURES USING C (P)	CORE PRACTICAL – II(CP)	2	2

Objectives:

- To develop and execute C programs for various data structures
- To apply the knowledge of programming features
- To Implement various Algorithms

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Recall program execution and debugging	K1
CO2	Demonstrate the ideas of Data structures	K2
CO3	Make use of Operations of Linear and Non- linear data structures	K3
CO4	Develops the ability to analyze a problem and implement an algorithm to solve it.	K4
CO5	Acquire logical thinking, Identify the correct and efficient ways of solving problems	K5

Mapping with Programme Outcomes

COs\POs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	1	2	3	2	1	2	2
CO2	3	2	3	1	2	3	2	2	2	2
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	2	2	2	2	3	3	2	2	2
CO5	3	3	3	2	3	3	3	2	2	2

Syllabus

1. Stack implementation
2. Operations on Queue
3. Linked List
4. Binary Tree Traversal
5. Operations of Graph
6. Sorting
7. Searching

Web References

1. <https://www.geeksforgeeks.org/data-structures/>
2. <https://techdevguide.withgoogle.com/paths/data-structures-and-algorithms/>
3. <https://www.freecodecamp.org/news/learn-data-structures-and-algorithms/>

Course Designer

1. Dr. A. Bhuvaneswari, Associate Professor, Department of Information Technology.
2. Dr. P. Tamil Selvi, Associate Professor, Department of Information Technology.

ANNEXURE M



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG & RESEARCH DEPARTMENT OF MICROBIOLOGY
B.Sc., MICROBIOLOGY – Programme Structure
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2023-2024 and onwards)
SEMESTER II

Semester	Part	Course	Title	Subject Code	Inst. Hrs/Week	Credits	Exam			Total
							Hrs	Marks		
								Int.	Ext.	
II	I	Language Course–II (LC) Tamil*/Other Languages	பொதுத்தமிழ்- II	23ULT2	6	3	3	25	75	100
			Prose, Grammar and History of Sanskrit literature	23ULS2						
			Hindi Literature & Grammar -II	22ULH2						
			Basic French-II	22ULF2						
	II	English Language Course-II(ELC)	General English - II	23UE2	6	3	3	25	75	100
	III	Core Course–II (CC)	Microbial Physiology	23UMB2CC2	4	4	3	25	75	100
		Core Course–III (CC)	Molecular Biology	23UMB2CC3	3	3	3	25	75	100
		Core Practical–II (CP)	Microbial Physiology and Molecular biology (P)	23UMB2CC2P	4	3	3	40	60	100
		First Allied Course–III (AC)	Biochemistry II	23UMB2AC2	3	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - II	Environmental Studies	22UGEVS	2	2	3	100	-	100
		Ability Enhancement Compulsory Course - III	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
				TOTAL	30	22				800

Semester: II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23UMB2CC2	MICROBIAL PHYSIOLOGY	CORE COURSE	4	4

Course Objective

- To impart among the learners the fundamental principles of microbial physiology.
- To understand the kinetics of microbial growth and influence of varied physio chemical parameters.
- To provide basic knowledge about metabolism and respiration.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive level
CO 1	State nutritional requirements and uptake of microorganisms.	K1, K2, K3, K4
CO 2	Explain phases and factors of growth	K1, K2, K3, K4
CO 3	Describe the Carbohydrate metabolism	K1, K2, K3, K4
CO 4	Compute the importance of Anaerobic Respiration and fermentation pathway.	K1, K2, K3, K4, K5
CO 5	Impart knowledge about protein and lipid metabolisms.	K1, K2, K3, K4, K5

Mapping of CO with PO and PSO

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	3	2	2	3	2	3
CO2	3	3	2	3	3	2	2	3	3	3
CO3	2	3	3	2	3	3	3	2	3	3
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Metabolism and Nutrition: Introduction to Metabolism – Definition, types of metabolism and metabolic pathways. Nutrition – Micro and macro nutrient requirements of microorganisms. Nutritional Classification – Autotrophs, heterotrophs, photoautotrophs, chemoautotrophs, chemolithotrophs, oligotrophs. Transport mechanism – Passive diffusion, Facilitated diffusion, Active transport and group translocation.	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
II	Microbial Growth: Phases of Growth, Growth curve. Factors influencing the growth of microorganisms – temperature, pH, salt, Osmotic pressure, and radiations. Growth measurements – batch, continuous, synchronous and Diauxic culture.	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
III	Anaerobic Respiration: Nitrate, sulphate & Methane respiration. Fermentations – alcohol, mixed acid, lactic acid fermentation.	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
IV	Carbohydrate Metabolism: Embden Mayer– Hoff – Parnas (EMP) pathway, HMP Shunt, Krebs's cycle (TCA) cycle - Electron transport chain, Phosphorylation, oxidative and substrate level phosphorylation.	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
V	Protein, Lipid and Nucleic acid metabolism: Synthesis and degradation of amino acids (glycine and threonine), peptides, proteins. Biosynthesis and β Oxidation of fatty acids, Biosynthesis and degradation of purine and pyrimidine.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Enzymes: classification & nomenclature, properties, Michaelis-Menton equation for simple enzymes, coenzymes and cofactors, isozymes.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text books

1. Dubey, R.C. and D.K. Maheshwari. (2022) A Text Book of Microbiology, S. Chand and Company Ltd., New Delhi.
2. Rani Gupta and Namita Gupta. (2022). Fundamentals of Bacterial Physiology and Metabolism, Springer Nature, Singapore.
3. Ananthanarayan Paniker. (2020). A Text book of Microbiology. 11th Edition. University Press. Singapore.

4. Madigan M.T., Martinko J.M., and Parker J. (2019). Biology of Microorganisms. 12th Edition, MacMillan Press. England.
5. Atlas R.A. and Bartha R. (2019). Microbial Ecology. Fundamentals and Application. 4th edition, Benjamin Cummings, New York.

Reference Books

1. Tortora G.J., Funke B.R. and Case C.L.(2020). Microbiology: An Introduction. 9th Edition, Pearson Education, Singapore.
2. Black J.G. (2018). Microbiology-principles and explorations, 6th edition. John Wiley and Sons, Inc. New York.
3. MoselioSchaechter and Joshua Leaderberg. (2019). The Desk encyclopedia of Microbiology. 2ndedition. Elsevier Academic press, California.
4. Madigan M.T., Martinko J.M. and Parker J.(2019). Biology of Microorganisms, 12th Edition. MacMillan Press, England.
5. Michel Mandigan, Kelly S.Bender, Daniel buckley, W Mathew Sattley and David Stahl. (2019). Borck biology of microorganisms, 15th Edition, Pearson.

Web References

1. https://uomustansiriyah.edu.iq/media/lectures/6/6_2017_08_09!09_50_48_AM.pdf
2. <https://biologydictionary.net/anaerobic-respiration/>
- 3.[https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology_\(Kaiser\)/Unit_7%3A_A_Microbial_Genetics_and_Microbial_Metabolism/18%3AMicrobial_Metabolism/18.3%3AAerobic_Respiration](https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology_(Kaiser)/Unit_7%3A_A_Microbial_Genetics_and_Microbial_Metabolism/18%3AMicrobial_Metabolism/18.3%3AAerobic_Respiration)
- 4.[https://bio.libretexts.org/Bookshelves/Biochemistry/Fundamentals_of_Biochemistry_\(LibreTexts\)/02%3A_Unit_II-_Bioenergetics_and_Metabolism/22%3ABiosynthesis_of_Amino_Acids_Nucleotides_and_Related_Molecules/22.02%3ABiosynthesis_of_Amino_Acids](https://bio.libretexts.org/Bookshelves/Biochemistry/Fundamentals_of_Biochemistry_(LibreTexts)/02%3A_Unit_II-_Bioenergetics_and_Metabolism/22%3ABiosynthesis_of_Amino_Acids_Nucleotides_and_Related_Molecules/22.02%3ABiosynthesis_of_Amino_Acids)
5. <https://www.youtube.com/watch?v=9CPIs-Qhg-M>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr. N.Jeenathunisa

SEMESTER: II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT
23UMB2CC3	MOLECULAR BIOLOGY	CORE COURSE –III (CC)	3	3

Course Objective:

The paper Molecular Biology encompasses the basic study and understanding the central dogma. It helps in understanding the basic organization of the genome of prokaryotes and eukaryotes. It is followed by prokaryotic and eukaryotic replication, transcription, translation processes and regulation.

Prerequisites

Basic knowledge on function of various genes and proteins for better understanding of cellular life processes.

Course Outcomes and Cognitive Level Mapping

COs	CO Statement	Knowledge level
CO1	Define the basic Properties of DNA	K1
CO2	Recite the knowledge about replication of DNA	K1
CO3	Critique knowledge about central dogma of biology	K4
CO4	Generalize the basic idea of Gene transfer mechanisms	K6
CO5	Expand about mutation	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	2	3	3	3	3	3	3	2	3
CO3	2	3	3	3	3	3	3	2	3	3
CO4	3	3	2	3	3	3	3	3	3	2
CO5	3	3	3	3	2	3	2	3	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “–” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	UNIT I: History and concepts in Molecular Biology Milestones in history–Definition of nucleic acids-Experimental proofs of DNA as the genetic material (Griffith and Hershey Chase) – Experimental proofs of RNA as the genetic material - Chemistry and molecular structure of DNA double helix – Discovery of DNA structure – Brief account on types and forms of DNA –Definition of a gene. Organization of DNA in eukaryotic cell; Palindromic DNA; Types of RNA-rRNA; mRNA, SnRNA the 5' cap, non- coding region, initiation, coding region, termination codon; Poly (A) region, post transcriptional modification. Brief note on plasmids: structure and its types.	9	CO1, CO2, CO4, CO5	K1, K2, K3, K4,
II	UNIT II : DNA Replication Watson and Crick's model of DNA replication (experimental evidence); Enzyme involved in DNA replication (DNA polymerase I, Pol II, Pol III, DNA ligase); Mechanism of DNA replication; Models of DNA replication, inhibitors of DNA replication. Exonuclease and endonuclease. Theta replication and Rolling circle replication. Replication of RNA – reverse transcriptase.	9	CO1, CO2, CO3, CO4,	K1, K2, K3, K4,
III	UNIT III : Transcription and Translation DNA Transcription: Definition – Brief account on transcriptional machinery and mechanism of transcription — RNA Translation: Definition – Brief account on translational machinery, mechanisms of translation and Splicing mechanism. Regulation of gene expression: Concept of Gene, Genetic code & its properties. Wobble concept, prokaryotic and eukaryotic ribosomes, detailed account of structure, function and regulation of <i>lac</i> operon, <i>trp</i> operon and <i>ara</i> operon.	9	CO1, CO2, CO3, CO4	K2, K3, K4, K5

IV	UNIT IV: Gene transfer mechanism Gene transfer mechanisms: Conjugation, Transformation and Transduction. Discovery of Transformation, Natural competence and its mechanism - Conjugation - Discovery, F+ v/s F-, Hfr+ v/sF. Transduction – Generalized and specialized transductions. Transposons – Structure, genetic organization and mechanism of transposition. Polymerase Chain Reaction & types.	9	CO1, CO2, CO3, CO4	K2, K4, K5, K6
V	UNIT V : Mutation Definitions of mutations, mutagenesis and mutants - types of mutations; Gene diversity; Split genes, overlapping gene; Molecular nature of Mutation, Spontaneous and Induced mutation; DNA damage repair – Types of damage (deamination, Oxidative damage, Alkylation, Pyrimidine dimmers. Hybridization techniques: Southern, Northern & Western Blotting. Physical and Chemical mutagens, Carcinogenicity testing (AMES Test)- Applications of Mutations.	9	CO1, CO4 , CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not included for End Semester Examinations) Cancer- Types, properties, causes, treatment and Oncogenes and tumour suppressor genes.	-	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5

Text Books:

1. Clark David (2019) *Molecular Biology*, Academic Cell.
2. Gerald Karp, Janet Iwasa and Wallace Marshall (2016) *Karp's Cell and Molecular Biology*, Wiley.
3. Joanne Willey, Linda Sherwood (2016) *Prescott's Microbiology*, Mc-Graw– Hill Publishing Company Ltd.
4. Veer Bala Rastogi (2015) *Principles of Molecular Biology* Med tech.
5. Verma P S and Agarwal V K (2015) *Cell biology, Genetics, Molecular Biology Evolution and Ecology*, S. Chand and Company Ltd.

Reference Books

1. 1. Tania A. Baker, Stephen P. Bell, Michael Levine and Richard Losick. (2013) *Molecular Biology of the Gene*. 7th Edition. Benjamin/Cummings Publ. Co., Inc., California.
2. 2. Rosalee S. Hell berg T.A. Brown. (2011). *Introduction to genetics: A molecular approach*. 1st Edition. Garland Science.
3. 3. Geoffrey M Cooper (2016) *Cell: A Molecular Approach*, Sinauer Associates Inc.
4. 4. Bernard R Glick and Cheryl L Patten (2017) *Molecular Biotechnology: Principles and Applications of Recombinant DNA*, ASM Press.

Web Links:

1. https://pages.jh.edu/rschlei1/Random_stuff/publications/molbiogene.pdf
2. https://www.fmed.uniba.sk/uploads/media/Introduction_to_Medical_and_Molecular_Biology.pdf
3. <https://www.aacb.asn.au/documents/item/3400>

4. https://molbiomadeeasy.files.wordpress.com/2013/09/fundamental_molecular_biology.pdf
<https://users.ugent.be/~avierstr/pdf/principles.pdf>
5. https://pages.jh.edu/rschlei1/Random_stuff/publications/molbiogene.pdf

Pedagogy

Power Point Presentations, Group Discussion, Seminar, Quiz, Assignment and Brain Storming Activity.

Course Designer

Ms.S.Sathya

Semester: II	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23UMB2CC2P	MICROBIAL PHYSIOLOGY AND MOLECULAR BIOLOGY (P)	CORE PRACTICAL	4	3

Course Objective

- To enable the students to understand the basic knowledge of
- To acquire adequate skill to handle microscope to visualize microbes.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive level
CO 1	Develop the skills to grow microbes in the laboratory.	K1
CO 2	Illustrate effect of pH, temperature and salt on microbes.	K2
CO 3	Evaluate the growth of microbial cell.	K3
CO 4	Analyze enzymatic hydrolysis reactions.	K3
CO 5	Interpret biochemical test and results to identify bacteria	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	3	2	2	2	3
CO2	3	2	3	3	2	3	2	2	3	3
CO3	3	3	3	2	3	3	3	3	3	2
CO4	3	3	2	3	2	3	2	2	3	2
CO5	3	3	3	2	3	3	3	3	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no Correlation

Syllabus

1. Effect of pH on the growth of microbes.
2. Effect of Temperature on the growth of microbes.
3. Effect of salt on the growth of microbes.
4. Determination of growth curve – direct count, viable count and spectrophotometric assay.
5. Enzymatic Hydrolysis of Starch, Gelatin, Casein.
6. Oxidase test.
7. Catalase test.
8. Biochemical test -Indole test, Methyl Red test, Voges Proskauer test, Citrate Utilization test, Triple Sugar Iron test and Carbohydrate fermentation test.
9. Isolation of Chromosomal DNA from bacteria.
10. Isolation of Plasmid DNA from bacteria.
11. Characterization of Plasmid DNA by Agarose gel electrophoresis.
12. Demonstration of PCR.

Reference Books

1. Bharti Arora, D.R. Arora, (2020). Practical Microbiology, CBS Publishers & Distributors.
2. Mudili J. (2020). Introductory Practical Microbiology, Narosa Publishers.
3. Das S (2020). Microbiology Practical Manual, CBS Publishers.
4. Swagat Kumar Dash, Hrudayanath Thatoi and Supriya Dash. (2020). Practical Biotechnology: Principles and Protocols, Dreamtech Press.
5. Saravanan R, D. Dhachinamoorthi and CH. MM. Prasada Rao. (2019). A Handbook of Practical Microbiology, LAP LAMBERT Academic Publishing.
6. Shukla Das and Rumpa Saha. (2019). Microbiology Practical Manual, 1st Edition, CBS Publishers and Distributors.
7. Michael J Leboffe and Burton E. (2019). Pierce Microbiology: Laboratory Theory & Application, Morton Publishing Company.
8. Ashwani Kumar, Gakhar S K and Monika Miglani. (2019). Molecular Biology: A Laboratory Manual, Dreamtech Press.
9. Siddra Ijaz and Imran Ul Haq. (2019). Recombinant DNA Technology, Cambridge Scholar UK.
10. Amita Jain, Jyotsna Agarwal and Vimala Venkatesh. (2018). Microbiology Practical Manual, 1st edition, Elsevier India.

Web References

1. <https://www.youtube.com/watch?v=yDAcepSV-tU>
2. <https://www.youtube.com/watch?v=qGkpW5W25K0>
3. <https://www.jove.com/v/10511/growth-curves-generating-growth-curves-using-colony-forming-units>
4. [https://bio.libretexts.org/Courses/North_Carolina_State_University/MB352_General_Microbiology_Laboratory_2021_\(Lee\)/07%3A_Microbial_Metabolism/7.01%3A_Introduction_to_Biochemical_Tests_Part_I](https://bio.libretexts.org/Courses/North_Carolina_State_University/MB352_General_Microbiology_Laboratory_2021_(Lee)/07%3A_Microbial_Metabolism/7.01%3A_Introduction_to_Biochemical_Tests_Part_I)
5. <https://www.youtube.com/watch?v=gkZ1CMKeP0w>
6. <https://microbiologyinfo.com/category/biochemical-test/>
7. https://www.researchgate.net/publication/320508474_Molecular_Biology_Laboratory_manual

Pedagogy

Power point presentations, Group Discussion, Quiz, Brain Storming Activity.

Course Designer

Dr. N. Jeenathunisa

Semester: II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23UMB2AC2	BIOCHEMISTRY II	FIRST ALLIED COURSE	3	3

Course objective

- To Learn about the Types of Blood cells, composition, function, deficiency diseases of RBC and WBC.
- To make the students to know about the structural features of plasma membrane, cellular transport mechanisms with specific examples.
- To acquire about the Endocrine glands and it's structure, classification of Hormones and it's biosynthesis, functions and deficiency diseases.

Prerequisites

To understand the knowledge about the structure and function of plant hormones and secondary metabolites-Alkaloids and flavonoids.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive level
CO 1	Evaluate the basic Concept of Blood and its components, Deficiency Diseases	K2
CO 2	Describe the various models of cell Membrane and transport mechanisms	K2
CO 3	Discuss the Endocrine Glands and their hormones with deficiency diseases	K3
CO 4	Compare the Plant pigments with their biosynthesis and significance	K4
CO 5	Explain the structure of Plant hormones with its structure and function	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	2	3	2	2	3
CO2	2	2	3	2	2	3	2	3	3	3
CO3	3	2	1	3	2	2	2	3	2	2
CO4	2	2	3	2	3	3	3	2	3	2
CO5	3	3	2	3	2	3	2	3	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Cytochemistry: Cytochemistry –Plasma membrane-composition and functions–Danielli Davson Model- Fluid mosaic model, Trilaminar model. Mechanism of cell membrane transport – Active, Passive and Facilitated diffusion – Uni, sym and antiports – Na^+ - K^+ ATPase and iron transport	9	CO1, CO2, CO4, CO5	K1,K2, K3,K4,
II	Haematology : Blood and its components: Types of Blood cells – origin – Composition of Blood– Characterization and coagulation Significance of platelets–WBC-Types, structure and functions - Deficiency RBC–Structure, Formation-Functions– Anaemia – Sick cell - Aplastic-Hemolytic	9	CO1, CO2, CO3, CO4,	K1,K2, K3,K4,
III	Animal hormones: Hormones of pituitary, thyroids, parathyroid, pancreas, adrenal Glands-testis and ovarian Hormones –Structure, functions, deficiency diseases associated hormones	9	CO1, CO2, CO3, CO4	K2, K3, K4K5
IV	Plant hormones: Plant hormones – Discovery, structure and functions of Auxins - chemistry, biological function and metabolism of Gibberellins-Functions and mode of action of Cytokinin– Structure and functions of Absciscic acid.	9	CO1, CO2, CO3, CO4	K2, K4 K5, K6
V	Plant pigments: Plant pigments – chlorophyll, carotenoids –Phycobilins and anthocyanin structure – Biosynthesis – functions	9	CO1, CO4 , CO5	K1,K2, K3,K4, K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Hemophilin – Leucocytosis Polycythemia – Thalassemia – Van willebrand disease	-	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5

Text Books

1. William, J.Marshall and Stephan, K.Bangert.2014. 3rd Edition. Clinical Biochemistry – Metabolic and Clinical Aspects – Churchill Livingston, New York.
2. Ambika Shanmugam.2016. Biochemistry for Medical Students. 8th Edition. Wolters Kluwer India Pvt. Ltd.
3. Satyanarayana.U. 2020.Biochemistry. 5th Edition. Elsevier. RELX India Pvt. ltd,
4. Seema Pavgi Upadhye.2020. Textbook of Biochemistry. 4th Edition. Dreamtech Press.
5. Harper's.2018. Illustrated Biochemistry. 31st Edition. McGraw Hill / Medical Publishers.

References

1. Stryer, L.1995.Biochemistry. 4th Edition. W.H. Freeman and Company, New York.
Dinesh puri.2020. Textbook of Medical Biochemistry.4th Edition. Elsevier India
2. Donald voet and Judith voet.1990. Biochemistry. John Wiley and Sons, New York.
3. Hubert, Stryer, 1995. Biochemistry – Freeman and Company, New York.
4. Dawn, B.Markus, 1994. Biochemistry.Harwal Publishing, New York.

Web References

1. <https://byjus.com/neet/plant-hormones/>
2. <https://www.hopkinsmedicine.org/health/conditions-and-diseases/hormones-and-the-endocrine-system>
3. <https://byjus.com/neet/types-of-blood-cells-notes/>

Pedagogy

Power point presentations, Group Discussion, Brain Storming Activity.

Course Designer

Dr. N. Pushpa

Semester: II	Internal Marks:100			
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UGEVS	ENVIRONMENTAL STUDIES	ABILITY ENHANCEMENT COMPULSORY COURSE	2	2

Course Objective

To train the students to get awareness about total environment and its related problems and to make them to participate in the improvement and protection of the environment.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Outline the nature and scope of environmental studies	K1, K2
CO2	Illustrate the various types of natural resources and its importance.	K2
CO3	Classify various types of ecosystem with its structure and function.	K2, K3
CO4	Develop an understanding of various types of pollution and biodiversity.	K3
CO5	List out the various types of social issues related with environment and explain protection acts	K4, K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3	2	2	3	2	3
CO2	3	3	2	3	3	3	2	3	3	3
CO3	2	3	3	2	3	3	3	3	3	2
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1”–Slight (Low)Correlation

“2” – Moderate (Medium) Correlation

“3”–Substantial (High)Correlation

“-“indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to environmental studies Definition, scope and importance. Need for public awareness	06	CO1, CO2, CO3, CO4	K1, K2, K3,
II	Natural Resources: Renewable and non-renewable resources: Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. Mineral resources: Use and exploitation ,environmental effects of extract incandescing mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies. Land resources: Land as resources, land degradation, man induced Landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.	06	CO1, CO2, CO3, CO4	K1, K2, K3
III	Ecosystems Concept, Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flowing the ecosystem and Ecological succession. Food chains, food webs and ecological pyramids Introduction, types, characteristic features, structure and function of the following ecosystem: - Forest ecosystem, Grassland ecosystem and Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	06	CO1, CO2, CO3, CO4	K1, K2, K3

IV	Biodiversity and Environmental Pollution Introduction, types and value of biodiversity. India as a mega diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Definition, Causes, effects and control measures of: a. Air Pollution b. Water Pollution c. Soil Pollution d. Noise pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes. E-Waste Management: Sources and Types of E-waste. Effect of E-waste on environment and human body. Disposal of E-waste, Advantages of Recycling E-waste. Role of an individual in prevention of pollution. Disaster management: floods, earthquake, cyclone and landslides.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Social Issues and the Environment Water conservation, rainwater harvesting, watershed management. Climate change, global warming, acid rain, ozone layer depletion, Wasteland reclamation. Environment Protection Act Wildlife Protection Act. Forest Conservation Act. Population explosion – Family Welfare Programmes Human Rights – Value Education. HIV/ AIDS - Women and Child Welfare. Role of Information Technology in Environment and human health.	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Global warming – climate change – importance of ozone – Effects of ozone depletion. Biogeography –history, ecology and conservation. International laws and policy	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

References

1. Sarita Kumar . 2021. Fundamentals of Environmental Studies for Undergraduate Courses (1st edition). Sultan Chand
2. Aruna Kumari Nakkella. 2022. Environmental Science (1st edition). Bharti Publications.
3. Pallabigoswami. 2023. Environmental studies (1st edition). Ashok publication.
4. Beard, J.M. 2013. Environmental Chemistry in Society(2ndedition). CRC Press.
5. Girard, J.2013. Principles of Environmental Chemistry (3rdedition). Jones & Bartlett.
6. Brebbia, C.A.2013. Water Resources Management VII. WIT Press.
7. Hites, R.A. 2012. Elements of Environmental Chemistry(2ndedition). Wiley & Sons.
8. Harnung, S.E. & Johnson, M.S. 2012. Chemistry and the Environment. Cambridge University Press.
9. Boeker, E. & Grondelle, R. 2011. Environmental Physics: Sustainable Energy and Climate Change. Wiley.
10. Forinash, K.2010. Foundation of Environmental Physics. Island Press.
11. Evans, G.G. & Furlong, J. 2010. Environmental Biotechnology: Theory and Application (2nd edition). Wiley-Blackwell Publications.
12. Williams, D.M., Ebach, M.C.2008. Foundations of Systematics and Biogeography. Springer
13. Pani, B.2007. Textbook of Environmental Chemistry. IK international Publishing House.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr.B. Thamilmaraiselvi



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG & RESEARCH DEPARTMENT OF MICROBIOLOGY
B.Sc., MICROBIOLOGY – Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

SEMESTER IV

Semester	Part	Course	Title	Subject Code	Inst. Hrs/Week	Credits	Exam			Total
							Hrs	Marks		
								Int.	Ext.	
IV	I	Language CourseIV(LC) Tamil*/Other Languages*	பண்டையஇலக்கியமும் உரைநடையும்	22ULT4	6	3	3	25	75	100
			Drama, History of Drama Literature	22ULS4						
			Hindi Literature & Functional Hindi	22ULH4						
			Intermediate French-II	22ULF4						
	II	English Language Course - IV(ELC)	Learning Grammar Through Literature-II	22UE4	6	3	3	25	75	100
	III	Core Course–V (CC)	Immunology	22UMB4CC5	6	6	3	25	75	100
		Core Practical–IV (CP)	Immunology (P)	22UMB4CC4P	4	4	3	40	60	100
		Second Allied Course–III (AC)	Bioinformatics	22UMB2AC6	4	3	3	25	75	100
		Internship	Internship	22UMB4INT	-	2	-	-	-	100
	IV	Generic Elective Course II (GEC)	A. Biofertilizer Technology	22UMB4GEC2	2	2	3	25	75	100
			B. Basic Tamil- II	22ULC4BT2						
			C. Special Tamil- II	22ULC4ST2						
		Skill Enhancement Course I (SEC)	Herbal Medicine(P)	22UMB4SEC1P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM		As per UGC Recommendation					
	TOTAL					30	25			

Semester IV	Internal Marks:25		External Marks :75	
Course Code	Course Title	Category	HOURS/WEEK	CREDIT
22UMB4CC5	IMMUNOLOGY	CORE COURSE	6	6

Course Objectives

The aim of the course is to teach the types of immunity, immune system, antigen, antigen – antibody reaction, T and B cell activation, lymphokines and cytokines, hyper sensitivity reaction, autoimmune diseases and transplantation of immunity.

Prerequisites

Basic knowledge and concepts of immunology

Course Outcome and Cognitive Level Mapping

COs	CO Statement	Cognitive Level
CO1	Understand the history and types of immunity.	K1,K2,K4
CO2	Demonstrate the various antigen- antibody techniques.	K3,K4
CO3	Differentiate the structure of MHC, Cytokines and lymphokines.	K4,K5,K6
CO4	Explain immune technology and its applications.	K4,K6
CO5	Explain the knowledge about hypersensitivity reactions	K5,K6

Mapping with Programme Outcomes

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	2	3	3	3	3	2	3
CO2	3	2	3	3	2	2	3	2	3	3
CO3	3	2	2	3	3	3	2	3	3	2
CO4	2	3	3	2	3	3	3	2	3	2
CO5	3	3	2	3	2	3	3	3	2	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” – indicates there is no correlation

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	History and overview of the Immune system : Cells and organs of the Immune system - Origin, development. Immuno haematology - blood groups, blood transfusion, Rh incompatibility. Immunity - types of immunity - cell mediated, Innate and acquired immunity. Differentiation of T and B cells and their receptors.	18	CO1, CO2, CO4, CO5	K1, K2, K3, K4, K5
II	Antigen - antibody reactions : Antigens- properties, types, biology of antigens, Haptens, adjuvants, epitope, paratope, cross reactivity and Forssman antigen. Immunoglobulin - structure, properties, types and functions. Theories of antibody production. Complement- alternative and classical pathways. Antigen - Antibody reaction - Precipitation, Agglutination, Immunodiffusion and Complement Fixation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Immune response: Cell mediated and humoral. MHC, Cytokines, lymphokines - structure, function and their receptors. Vaccines – types, toxoids and anti-toxin. Transplantation Immunology- types of transplants, Tissue typing, Graft - rejection mechanism. Hyper acute, acute and chronic Reactions	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5
IV	Immuno techniques: Monoclonal antibody production, properties and its applications. ELISA, RIA, Immuno fluorescence - FISH, Immuno electrophoresis and WIDAL.	18	CO1, CO2, CO3, CO4, CO5	K2, K4, K5, K6
V	Hypersensitivity Reactions: Introduction, Definition - allergy, allergens, types – Immediate (Type I, Type II, Type III) and delayed (Type IV) Hypersensitivity reactions. Cancer Immunology - Introduction, tumour of immune system, tumour antigens, types of tumours and immuno therapy. Basic concept of autoimmunity – Organ specific and systemic auto immune diseases.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not included for End Semester Examinations) Clinical manifestations of graft rejection – CRP, Pregnancy test, RPR and VDRL	-	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5

Text Books

1. AbulK. Abbas, Andrew, H.Lichtman, ShivPillai (2019).Basic Immunology :Functions and Disorders of the Immune System 6th Edition, Elsevier

2. Robert R. Rich, Thomas A Fleisher, William T. Shearer, Harry Schroeder, Anthony J. Frew, Cornelia, M. Wey and (2018). Clinical Immunology :Principles and Practice, Elsevier
3. Abul K. Abbas, Andrew, H. Lichtman, Shiv Pillai (2017). Cellular and Molecular Immunology 9th Edition, Elsevier
4. Peter J. Delves, Seamus J. Martin, Dennis R. Burton, Ivan M. Roitt (2017). Roitt's Essential Immunology, Wiley- Black well

Reference Books

1. A Wesley Burks, Stephen T Holgate, Robyn E O'Hehir, Leonard B. Bacharier, David H. Broide, Gurjit K. Khurana Hershey, Jr. R. Stokes Peebles (2019). Middleton's Allergy E-Book :Principles and Practice, Elsevier
2. Lauren M. Sompayrac (2019). How the Immune System Works, Wiley-Blackwell
3. Kenneth Murphy, Casey Weaver (2016). Janeway's Immunobiology 9th Edition, Garland Science
4. William E. Paul (2012). Fundamental Immunology 7th Edition, Kindle Edition

Web links

1. <https://www.immunology.org/public-information/what-is-immunology>
2. <https://aacijournal.biomedcentral.com/articles/10.1186/1710-1492-7-S1-S1>
3. <https://onlinelibrary.wiley.com/journal/13652567>
4. <https://www.frontiersin.org/articles/10.3389/fimmu.2019.00684/full>
5. https://emedicine.medscape.com/allergy_immunology

Pedagogy

Power point presentations, Group Discussion, Seminar, Quiz, Assignment, Brain Storming activity

Course Designer

Dr.B.Thamilmaraiselvi

Semester: IV	Internal Marks:40	External Marks:60

COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB4CC4P	IMMUNOLOGY (P)	CORE PRACTICAL	4	4

Course Objective

To enable the students to identify, analyze and observe various techniques in immunology.

Prerequisites

To acquire adequate skill to handle immune techniques.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive level
CO1	Recall the immunological reactions.	K1
CO2	Demonstrate the advance immunological techniques.	K2
CO3	Develops skills to hem agglutination.	K3
CO4	Competently count blood cells and its differentiation	K3
CO5	Explain various techniques in immunology.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	3	2	2	2	3
CO2	3	2	3	3	2	3	2	2	3	3
CO3	3	3	3	2	3	3	3	3	3	2
CO4	3	3	2	3	2	3	2	2	3	2
CO5	3	3	3	2	3	3	3	3	3	2

“1”–Slight (Low)Correlation

“2” – Moderate (Medium)

Correlation“3”–Substantial(High)Correlation

“-“indicates there is no correlation

Syllabus (60 Hours)

1. Haemagglutination – ABO Blood grouping.
2. Rh Typing
3. Total count(RBC and WBC).
4. Differential Count (WBC).
5. Agglutination reactions–WIDAL,RPR, CRP.
6. ASO
7. Precipitation reactions: Single and Double immune diffusion.
8. Demonstration of ELISA
9. Demonstration of western blotting

Reference Books

1. AbbasAK, LichtmanAH ,ShivPillai. Cellular and Molecular Immunology, 10th Edition. Elsevier, 2021.
2. Tobili Y. Sam-Yellowe. Immunology: Overview and Laboratory Manual. 2021(1st edition) Elsevier.
3. Saha r. Microbiology practical manual (2nd edition).Cbs publishers & distributors pvt. Ltd,2022.
4. Fumiichiro Yamamoto. ABO +logy (1st edition).Assign me a free ISBN; 2023.
5. Abbas. Cellular and Molecular Immunology(10th edition).South Asia Edition Paperback,2021.
6. Shrimati Dharmapal Shetty. CMR-NIIH Practical Guide to Laboratory Immuno hematology (1stedition). Jaypee Brothers Medical Publishers, 2020.

Web link

1. <https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/labs/frelingerlab/documents/Immunology-Lab-Manual.pdf>
2. <https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/labs/fr>
3. Monica Cheesbrough. District Laboratory Practice in Tropical Countries -Part I and II (Second Edition). Cambridge University Press, New Delhi.
4. <https://www.sciencedirect.com/book/9780128180068/clinical-immunology>
5. <https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/labs/frelinger-lab/documents/Immunology-Lab-Manual.pdf>
6. <https://www.scribd.com/doc/53764085/Immunotechniques>

Pedagogy

Power point presentations, Group Discussion, Quiz, Brain Storming Activity.

Course Designer

Ms.R. Kiruthiga

SEMESTER IV	INTERNAL MARKS : 25		EXTERNAL MARKS : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT
22UMB2AC6	BIOINFORMATICS	ALLIED	4	3

Course Objective:

This course is designed to provide comprehensive knowledge to the students regarding Bioinformatics.

Prerequisites

To Comprehend and analyze the basics of bioinformatics.

Course Outcomes and Cognitive Level Mapping

COs	CO Statement	Cognitive Level
CO1	Define the basics of bioinformatics	K1
CO2	Recite the knowledge about biological databases	K1
CO3	Critique knowledge about sequences	K4
CO4	Generalize the basic idea of metadata	K6
CO5	Expand the role of molecular biology	K6

Mapping with Programme Outcomes:

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	3	2	2	2	3
CO2	3	2	3	3	2	3	2	2	3	3
CO3	3	3	3	2	3	3	3	3	3	2
CO4	3	3	2	3	2	3	2	2	3	2
CO5	3	3	3	2	3	3	3	3	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to bioinformatics: Bioinformatics-Definition, History, Scope and Applications. Opportunities in Bioinformatics. Emerging areas of Bioinformatics	12	CO1, CO2, CO4, CO5	K1, K2, K3, K4, K5
II	Basic concepts in Molecular Biology: Introduction to Molecular Biology and genetics. Central dogma of life: DNA – RNA - Protein. Role of Bioinformatics in Human Genome Project. Introduction to Medline, Pubmed, OMIM. Genomics and proteomics (Basic concepts), Data mining.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Biological database: Biological databases, Importance of databases, Sequence and structure databases: EMBL, DDBJ, GenBank, PIR, SwissProt, CSD, PDB, NCBI.	12	CO1, CO2, CO3, CO4	K2, K3, K4, K5
IV	Sequence Alignments and Visualization: Introduction to Sequences, alignments and Dynamic Programming, Local alignment and Global alignment (algorithm and example), Pairwise alignment (BLAST and FASTA Algorithm) and multiple sequence alignment (Clustal W algorithm).	12	CO1, CO2, CO3, CO4	K2, K4, K5, K6
V	Meta data and Search: Introduction to Metadata and search; Indices, Boolean, Fuzzy, Neighboring search. The challenges of data exchange and integration. Ontologies, interchange languages and standardization efforts. General Introduction to XML, UMLS, CORBA, PYTHON.	12	CO1, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not included for End Semester Examinations) EXPASY, OMG / LIFESCIENCE, ENTREZ and SRS.	-	CO1, CO2, CO3, CO4	K2, K3, K4, K5

Text Books

1. Tiago Antao (2022). Bioinformatics with Python Cookbook, Packt Publishing Limited.

2. R. Sundaralingam, V. Kumaresan (2021). Bioinformatics, Saras Publication.
3. Vinita Chougule And MasiddKhalate (2020). Basics in Bioinformatics, Notion Press.
4. Andreas D. Baxevanis, Gary D. Bader, David S. Wishart (2020). BIOINFORMATICS Fourth Edition, Wiley.
5. Arthur Lesk (2019). Introduction to Bioinformatics Fifth Edition, OUP Oxford.

ReferenceBooks:

1. Jonathan Pevsner(2022). Bioinformatics and functional genomics, 3rd edition, John Wiley.
2. Namita Mendiratta, Parag Rastogi, S.C. Rastogi (2022). Bioinformatics: Methods and Applications: Genomics, Proteomics and Drug Discovery, PHI Learning.
3. Dr. Prachi Srivastava, Dr. Neha Srivastava, Er. Prekshi Garg, Er. Payal Trivedi (2021).
4. Bio Informatics (Vision and Approaches), Vayu Education of India.
5. Ken Youens-Clark (2021). Mastering Python for Bioinformatics: How to Write Flexible, Documented, Tested Python Code for Research Computing, Shroff/O'Reilly.
6. S.Gladis Helen Hepsyba, C.R.Hemalatha (2021). Basic Bioinformatics, MJP Publishers.

Weblinks:

1. [https://en.wikipedia.org/wiki/Bioinformatics#:~:text=Bioinformatics%20\(%2F%CB%8Cba%C9%AA.,sets%20are%20large%20and%20complex.](https://en.wikipedia.org/wiki/Bioinformatics#:~:text=Bioinformatics%20(%2F%CB%8Cba%C9%AA.,sets%20are%20large%20and%20complex.)
2. <https://www.genome.gov/genetics-glossary/Bioinformatics>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1122955/>
4. <https://academic.oup.com/bioinformatics>
5. <https://www.britannica.com/science/bioinformatics>

Pedagogy

Power point presentations, Groupdiscussion, Seminar, Quiz, Assignment, Brain storming activity

Course Designer

Dr.P.F.Steffi

Semester: IV	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	Credits
22UMB4GEC2	BIOFERTILIZER TECHNOLOGY	GENERIC ELECTIVE COURSE	2	2

Course Objectives

To enable the students to understand the role of beneficial microorganisms in biofertilizer production technology.

Prerequisites

Basic knowledge and concepts of Biofertilizer Technology

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define and understand importance of biofertilizer	K1, K2
CO2	Analyze and explain mass production of <i>Rhizobium</i>	K3, K4
CO3	Determine and apply <i>Azospirillum</i> and <i>Azotobacter</i> biofertilizer	K3, K4
CO4	Evaluate and categorize Blue green algae biofertilizer	K4, K5
CO5	Criticize and manage production of phosphate biofertilizer and VAM	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	1	3	2	3	3	2
CO2	2	2	2	2	2	3	2	3	2	2
CO3	2	3	1	2	3	3	2	3	2	2
CO4	3	2	3	2	2	3	2	3	2	1
CO5	3	3	3	3	2	3	2	3	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Biofertilizers: Definition - types, importance of biofertilizers in agriculture. Advantages and applications of Biofertilizers.	6	CO1, CO2, CO3	K1, K2, K3, K4
II	<i>Rhizobium</i>: characteristics, isolation, identification, mass multiplication, carrier-based inoculants, Field applications.	6	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
III	<i>Azospirillum</i> and <i>Azotobacter</i>: isolation and mass multiplication carrier-based inoculant, field applications. <i>Azotobacter</i> -characteristics, isolation, mass multiplication and field applications.	6	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,
IV	Blue green algae as biofertilizer: isolation, mass culture and field use of BGA inoculants. <i>Azolla</i> – mass cultivation and field application.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6,
V	Phosphate biofertilizers: isolation, mass production and field application. VAM-isolation, mass production, importance and field application.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Green manure, organic manure, organic farming, bio compost, vermicomposting – field Application.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Kannaiyan S, Kumar, K., Govindarajan K. (2010). Biofertilizer Technology. 1st Edition. Scientific Publishers.
2. Kumaresan V. (2015). Biotechnology. 1st Edition. Saras Publication.
3. Eric Davis. (2018). Biofertilizer Technology: Importance and their uses. 1st Edition. DSR Book distributors.
4. Dubey R.C. (2022). A Textbook of Biotechnology. 1st Edition. S Chand and company Ltd.
5. Malati Hitendra Aher. (2022). Biofertilizer and Algal Technology. 1st Edition. Sahitya Sagar Publications.

6. Namita Nath, Dharmeswar Barman. (2022). Biofertilizer. 1st Edition. ARB Publications.

Reference Books

1. Anil K Thakur, Susheel K Bassi, Kamajit Singh, Dinesh. (2020). Biofertilizers (Skill Enhancement course). 1st Edition. S Dinesh & Co.
2. Himadri Panda. (2022). The complete technology book on Biofertilizer and organic farming. 3rd Edition. NIIR Project consultancy services.
3. Joanne Willey, Kathleen Sandman, Dorothy Wood. (2022). Prescott's Microbiology. 12th Edition. Mc Graw Hill.
4. Krishnendu Acharya, Surjit Sen, Manjula Rai. (2019). Biofertilizers and Biopesticides. 1st Edition. Techno World.
5. Amitava Rakshit, Vijay Singh Meena, Manoj Parihar, Singh H B, Singh A K. (2021). Biofertilizers: Advances in bio- inoculants. 1st Edition. Woodhead Publishing.
6. Ramanathan N. (2019). Biofertilizer Technology. 1st Edition. Kalyani Publisher.

WebReferences

1. <https://byjus.com/biology/biofertilizers/>
2. <https://www.onlinebiologynotes.com/biofertilizer-advantages-types-methods-of-application-and-disadvantages/>
3. https://biocyclopedia.com/index/biotechnology/plant_biotechnology/biofertilizers/biotech_masscultivation.php#:~:text=Mix%20this%20carrier%20based%20culture,105%20to%20106.
4. <https://biotecharticles.com/Agriculture-Article/Blue-Green-Algae-Bio-Fertilizer-1073.html>
5. <https://krishi.icar.gov.in/jspui/bitstream/123456789/45882/1/AAU-PSB%20Biofertilizer.pdf>
6. <https://www.biotechnologynotes.com/biotechnology/vesicular-arbuscular-mycorrhiza-vam-biotechnology/1153>

Pedagogy

Power point presentations, Group Discussion, Seminar, Quiz, Assignment, Brain Storming Activity.

Course Designer

Dr. S. Jenny

Semester IV	InternalMarks:25	ExternalMarks:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT S
22UMB4SEC1P	HERBAL MEDICINE (P)	SKILL ENHANCEMENT COURSE	2	2

Course Objective:

To create a traditional knowledge of medicinally important plants in day to day life.

Prerequisites

To acquire a Practical Knowledge in collection and processing of Medicinal Plants

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive level
CO1	Cultivation of Medicinal Plants	K1
CO2	Recite the knowledge about medicinally important plants.	K2
CO3	Describe about tribal medicine and their uses in diseases.	K3
CO4	Apply the traditional knowledge of medicinal plants in Tamil nadu	K4
CO5	Associate of plants in day to day life	K5

Mapping of CO with PO and PSO

COs	PO1	PO2	PO3	PO4	PO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	2	3	3	2	2
CO2	2	2	2	2	3	2	2	3	2	2
CO3	3	2	1	2	3	3	2	2	3	1
CO4	2	3	2	3	2	2	3	2	2	2
CO5	2	2	3	2	2	1	2	3	2	3

“1” Slight (Low) Correlation

“3”- Substantial (High) Correlation

“2”- Moderate (Medium) Correlation

“-“ indicate there is no correlation

Syllabus

1. Cultivation of Medicinal Plants, *Aloe vera*, *Senna auriculata*, *Zingiber Officinale*, *Curcuma aromatic*, and *Curcuma aromatic*.
2. Standardization of herbal Raw material, Extract and Formulation of herbal plants.
3. Preliminary Phytochemical Screening, Quantitative of plant extract.
4. Determination of Aldehyde content.
5. Determination of Total Alkaloids
6. Determination of Flavonoids
7. Determination of Phenols
8. Preparation and evaluation of Turmeric cream.
9. Preparation and Standardization of Herbal lotion.
10. Preparation of herbarium and storage (Herbaira, Museum)

Text Books

1. Iris F. F. Benzie and Sissi Wachtel-Galor, 2011. Herbal Medicine, 2nd edition CRC Press/Taylor & Francis;
2. Joanne Barnes, Linda A. Anderson, John David Phillipson. 2007, Herbal Medicine.
3. K. G. Ramawat, 2013. Herbal Drugs: Ethnomedicine to Modern Medicine.
4. Dr. Pragati Kumar (Author), Dr. Pranay Wal (Author), Mr. Yatendra Singh (Author), 2022. A Text Book of herbal drug technology.

Reference Books

1. Evans M, Shaw A, Thompson E. A, Falk S, Turton P, Thompson T, Sharp D. 2007. BMC Complement Altern Med. 25. Vol. 7. Decisions to use complementary and alternative medicine (CAM) by male cancer patients: Information-seeking roles and types of evidence used.
2. Finkel T, Holbrook N. J. . 2000. Oxidants oxidative stress and the biology of ageing. Nature; 408:239–47.
3. Akhtar M.A, Hatwar S.K. 1996. Efficacy of Aloe vera extract cream in management of burn wound. J Clin Epidemiol. ;49 1:24.
4. Ashley F.L, O'Loughlin B.J, Peterson R, Fernandez L, Stein H, Schwartz A.N. 2010 The use of Aloe vera in the treatment of thermal and irradiation burns in laboratory animals and humans. Plast Reconstr Surg. 20:383–96.

Web Reference

1. <https://openstax.org/books/introduction-anthropology/pages/17-2-ethnomedicine#>
2. https://en.wikipedia.org/wiki/Plant_morphology

Pedagogy

Power point presentations, Group Discussion, Seminar, Quiz, Brain Storming Activity.

Course Designer

Dr. J. Ambika



Cauvery College for Women (Autonomous), Trichy-18

PG & Research Department of Microbiology

B.Sc., Microbiology

Learning Outcome Based Curriculum Framework (CBCS-LOCF)

For the Candidates admitted from the Academic year 2022-2023 onwards)

SEMESTER V

Semester	Part	Course	Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
V	III	Core Course –VI(CC)	Medical Microbiology	22UMB5CC6	6	6	3	25	75	100
		Core Course -VII(CC)	Agricultural and Environmental Microbiology	22UMB5CC7	6	6	3	25	75	100
		Core Course – VIII(CC)	Molecular Biology	22UMB5CC8	6	6	3	25	75	100
		Core Practical – V(CP)	Medical Microbiology, Agricultural and Environmental Microbiologyand Molecular Biology (P)	22UMB5CC5P	3	3	3	40	60	100
		Discipline Specific Elective – I (DSE)	A. Organic Farming	22UMB5DSE1A	5	4	3	25	75	100
	B. Medical Parasitology		22UMB5DSE1B							
	C. Fundamentals of Botany and Zoology		22UMB5DSE1C							
	IV	Ability Enhancement Compulsory Course-IV(AECC)	UGC Jeevan Kaushal -Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course –II(SEC)	Biofertilizer Technology (P)	22UMB5SEC2P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM		As Per UGC Recommendation					
TOTAL					30	29				700

Semester V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB5CC6	MEDICAL MICROBIOLOGY	CORE	6	6

Course Objective

To impart the students with advanced knowledge of the characteristics of medically important human diseases. To focus the pathogenicity of the medically important microorganisms. To familiarize the lab diagnosis, prophylaxis and treatment of the diseases

Prerequisite

Basic knowledge of different types of pathogens, diseases and their diagnosis.

Course Outcome and Cognitive Level Mapping:

CO Number	CO Statement	Cognitive level
CO 1	Describe and Classify the various pathogens and its Characterization.	K3,K4
CO 2	Analyze pathogenicity of bacterial, fungal, viral and protozoan disease	K4, K5
CO 3	Evaluate diagnostic methods of various diseases	K4, K5
CO 4	Explain prevention and treatment of diseases	K3, K5
CO 5	Collection of clinical samples and Identification of pathogens	K5, K6

Mapping with Programme Outcomes:

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3	3	3	3	2	3
CO2	3	2	3	3	2	2	3	2	3	3
CO3	3	2	3	2	3	3	2	3	3	2
CO4	2	3	3	2	3	1	3	2	3	2
CO5	3	3	2	3	2	3	3	3	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction - History, Koch's and River's Postulates- Normal microbial flora of the healthy human body, Host-pathogen interactions: Definitions of infection, invasion, primary and opportunistic pathogens, pathogenicity - virulence - toxigenicity, carriers and its types, endemic, epidemic, pandemic diseases and epidemiology – Infectious disease cycle.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Bacterial Diseases - Diseases of various organ systems: Causative agent, clinical symptoms, pathogenesis, mode of transmission, prevention and treatment of the following bacterial diseases (a) Streptococcal pneumonia infections (b) <i>Staphylococcus aureus</i> infections (c) Meningitis - Neisseria, (d) Leprosy, (e) Leptospirosis, (f) Respiratory diseases: Tuberculosis (g) Gastrointestinal disorders: Typhoid (h) Sexually transmitted diseases: Syphilis (i) Anaerobic wound infection – Tetanus.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Viral Diseases - Diseases of various organ systems: Causative agent, clinical symptoms, pathogenesis, mode of transmission, prevention and treatment of the following viral diseases (a) Respiratory diseases: common cold and influenza (b) Neurological diseases: Rabies (c) Muscular diseases – Polio (d) Liver diseases: Viral hepatitis (e) Immunodeficiency disease: - AIDS. A brief account on Prion diseases.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Fungal & Protozoan Diseases - Causative agent, clinical symptoms, pathogenesis, mode of transmission, prevention and treatment of the following fungal and protozoan diseases (a) Fungal – superficial and subcutaneous mycoses, (b) Protozoan: Amoebiasis, Malaria (c) Helminths – Filariasis, Ascariasis. Zoonotic diseases, Nosocomial and Community acquired infections.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Lab Diagnosis - Isolation and identification of pathogens from an infected patient: Collection and transport of various clinical specimens (Urine, stool, sputum and blood) for diagnosis – General methods of isolation and identification of bacterial, fungal, viral pathogens and protozoan parasites.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Chemotherapy – Mechanism of action of antibiotics, Mechanism of development of antibiotics resistance. Alternative antibiotics – Probiotics, prebiotics and synbiotics.			

Text books

1. Aejaaz Iqbal and Zafar Nowshad (2020). Medical microbiology: Millennium Edition, Notion Press
2. Baveja V and Baveja C P (2019). Medical Parasitology, Arya Publishing company
3. Mishra B (2018), Text Book of Medical Virology, CBS
4. Ananthanarayan and Paniker (2013). A Text book of Microbiology, Kindle Edition

Reference books

1. Sastry Apurba S and Bhat Sandhya (2020). Essentials of Medical Microbiology, Jaypee brothers, Medica publishers
2. Patrick R Murray , Ken S, Rosenthal and Michael A and PFaller (2020), Medical Microbiology, Elsevier
3. Ananthanarayan Paniker (2020). A Text book of Microbiology, University Press
4. Kenneth J Ryan, Nafees Ahmad and Andrew Alspaugh J (2018). Sherris Medical Microbiology, McGraw- Hill Education

Web References

1. <https://www.cdc.gov/tb/education/corecurr/pdf/chapter2.pdf>
2. http://apps.searo.who.int/PDS_DOCS/B5123.pdf3.<http://loyce2008.free.fr/Microbiologie/%20Micro%20%20Gillespie%20Hawkey%20%20Principles%20And%20Practice%20Of%20Clinical%20Bacteriology%202Nd%20Ed.pdf>

Pedagogy

Power Point Presentations, Group Discussion, Seminar, Quiz, Assignment and Brain Storming Activity.

Course Designer

Dr. P. Bhuvaneswari

Semester V	Internal Marks: 25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB5CC7	AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY	CORE COURSE	6	6

Course Objective:

To enable the students to get exposure on relationship between microbes and nature, its roles and its utilization for the creation of sustainable environment and their concept, Biofertilizer role, Biogeochemical cycle and Plant diseases.

Prerequisites:

Basic knowledge about Agricultural and Environment Microbiology.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive level
CO1	Define the basic view of soil Microorganisms.	K1
CO2	Explain the Microbial association in water.	K2
CO3	Understand the production of Biofertilizer	K3
CO4	Discuss about Plant diseases and Control measures	K4,K5
CO5	Discuss about Water pollution and water quality.	K6

Mapping of CO with PO and PSO

COs	PO1	PO2	PO3	PO4	PO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	2	3	2	2	3	2	2
CO3	3	3	1	2	3	3	3	3	3	1
CO4	3	3	2	3	2	2	3	2	2	2
CO5	2	3	3	2	3	1	3	3	3	3

“1”- Slight(Low) Correlation

“3”- Substantial(High) Correlation

“2”- Moderate (Medium) Correlation

“-“ indicate there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Bacterial diseases of agricultural crops: pathogens, symptoms, control measures with reference to paddy, cotton, maize, tomato, citrus, mango and potato. Plant protection –Phenolics – phytoalexins and related compounds. Bioinsecticides – viral (Baculovirus, NPV)- bacterial (Bacillus thuringiensis) and fungal (Trichoderma) - a brief note.	18	CO1, CO2, CO3	K1, K2, K3, K4
II	Bio-geo chemical cycles in soil: Carbon cycle, Nitrogen cycle – Nitrogen fixation, nitrification, denitrification, sulfur, iron and phosphorus cycles. Aerobiology – a brief introduction - droplet nuclei – aerosols - air-borne transmission of microbes and diseases and assessment of air quality.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4,
III	Diversity and distribution of microorganisms in soil: Soil Microflora- Bacteria, Fungi and Actinomycetes. Microbial interactions -mutualism, synergism, commensalism, amensalism, parasitism, predation and competition. Microbial interactions with plants – phyllosphere, mycorrhizae, rhizosphere and symbiotic association in root nodules. Biofertilizer – VAM, Rhizobium, Frankia, Azospirillum, Azotobacter, Cyanobacteria, Phosphobacteria and Azolla.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K6
IV	Types of wastes: solid and liquid wastes. Treatment of solid wastes - Thermal Treatment: Incineration, Gasification, Pyrolysis. Bioreactor Landfills-Biological Waste Treatment: Composting, Vermicomposting and vermicomposting. Treatment of liquid wastes – primary, secondary, tertiary treatment; anaerobic (methanogenesis), aerobic, Trickling, activated sludge, oxidation pond. Production of biogas from waste.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Aquatic microbiology: factors affecting microbial growth – temperature – pressure – light – salinity - turbidity – pH -inorganic and organic constituents. Aquatic habitats - freshwater - lakes, ponds and streams; marine habitats - estuaries, deep sea, hydrothermal vents, saltpans, coral reefs and mangroves and their microbial communities; zonation – food chain and food web.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Self-Study for Enrichment (Not to be included for End Semester Examination) Soil microbes and fertility of soil, bioaugmentation, xenobiotics degradation, plant growth promoting Rhizobacteria (PGPR), Role of biofertilizer in integrated nutrient management.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,

Textbooks

1. Alexander M. (1997). Introduction to soil microbiology, New York: John Wiley & Sons, Inc.
2. Ec Eldowney S., Hardman, D.J. and Waite, S. (1993). Pollution Ecology and Biotreatment.
3. Madigan, M.T., Martinka, M., Parker, J. and Brock, T.D. (2000). Environmental microbiology. Twelfth Edition, Biology Microorganisms, New Jerry: Prentice Hall. Mark Wheelis, (2010).
4. P.D.Sharma (2005). Microbiology-Rastogi Publication, India
5. D.J.Bagyaraj,G.Rangaswami.(2007). Agricultural Microbiology. Prentice, Hall of India Pvt New Delhi.

References

1. Mehrotra, R.S. (2000). Plant Pathology, New Delhi: Tata McGraw Hill Publishing Company Ltd. Pandey,
2. B.P. (1997). Plant Pathology (Pathogen & Plant Disease), New Delhi: S.Chand & Company Ltd.
3. Ray Chadhuri, S.P. (1999). A Manual of Virus Diseases of Tropical Plants, New Delhi: MacMillan Company of India Ltd.
4. Rengaswami, G. and Rajagopalan, S. (2007). Bacterial Plant Pathology. Coimbatore: Tamil Nadu Agriculture University.
5. Subba Rao, N.S. (1995). Soil Microorganisms and Plant Growth (3rd ed). New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.
6. Mark Wheelis, (2010). Principles of Modern Microbiology, New Delhi: Jones & Bartlett India Pvt.

Web References

1. <https://onlinelibrary.wiley.com/doi/book/10.1002/9781119525899>
2. https://agri-bsc.kkwagh.edu.in/uploads/department_course/plant_course.pdf
3. <https://www.slideshare.net/ShanidShanu1/agricultural-microbiology>
4. <https://agribooks.co/agricultural-microbiology-b-sc-agriculture-icar-e-course-pdf-download/>
5. https://books.google.co.in/books/about/Environmental_and_Agricultural_Microbiol.html?id=BnQ-EAAAQBAJ&redir_esc=y

Pedagogy

Power point presentations, Group Discussion, Seminar, Quiz, Assignment, Brain Storming Activity.

Course Designer

Dr.J.Ambika

Semester: V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB5CC8	MOLECULAR BIOLOGY	CORE COURSE	6	6

Course Objective

To encompasses the basic study and understanding the central dogma and helps in understanding the basic organization of the genome of prokaryotes and eukaryotes. It is followed by prokaryotic and eukaryotic replication, transcription, translation processes and regulation.

Prerequisite

Basic knowledge and concepts of Molecular biology.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive level
CO 1	State the Basic concept of Prokaryotic Genes	K1
CO 2	Define the Prokaryotic DNA Replication	K1
CO 3	Explain the DNA & RNA Transcription in Prokaryotes	K2
CO 4	Apply the view of Gene Transfer Mechanisms	K3
CO 5	Prepare the Mutation and DNA Repair Mechanisms	K3

Mapping of CO with PO and PSO

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	3	2	2	3	2	3
CO2	3	3	2	3	3	2	2	3	3	3
CO3	2	3	3	2	3	3	3	2	3	3
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Milestones in history –Definition of nucleic acids-Experimental proofs of DNA as the genetic material (Griffith and Hershey Chase) – Experimental proofs of RNA as the genetic material - Molecular structure of DNA double helix – Discovery of DNA structure – Brief account on types and forms of DNA –Definition of a gene. Organization of DNA in eukaryotic cell; Palindromic DNA; Types of RNA- rRNA, mRNA, SnRNA the 5' cap, non- coding region, initiation, coding region, termination codon; Poly (A) region, post transcriptional modification. Brief note on plasmids: structure and its types.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
II	DNA Replication: Watson and Crick's model of DNA replication (experimental evidence); Enzyme involved in DNA replication (DNA polymerase I, Pol II, Pol III, DNA ligase); Mechanism of DNA replication; Models of DNA replication, inhibitors of DNA replication. Exonuclease and endonuclease. Theta replication and Rolling circle replication. Replication of RNA – reverse transcriptase.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
III	DNA Transcription: Definition – Brief account on transcriptional machinery and mechanism of transcription — RNA Translation: Definition – Brief account on translational machinery, mechanisms of translation and Splicing mechanism. Regulation of gene expression: Concept of Gene, Genetic code & its properties. Wobble concept, prokaryotic and eukaryotic ribosomes, detailed account of structure, function and regulation of <i>lac</i> operon, <i>trp</i> operon and <i>ara</i> operon.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
IV	Gene transfer mechanisms: Conjugation, Transformation and Transduction. Discovery of Transformation, Natural competence and its mechanism - Conjugation - Discovery, F+ v/s F-, Hfr+ v/sF. Transduction – Generalized and specialized transductions. Transposons – Structure, genetic organization and mechanism of transposition. Polymerase Chain Reaction & types.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4

V	Mutation: Definitions of mutations, mutagenesis and mutants - types of mutations; Gene diversity; Split genes, overlapping gene; Molecular nature of Mutation, Spontaneous and Induced mutation; DNA damage repair – Types of damage (deamination, Oxidative damage, Alkylation, Pyrimidine dimmers. Hybridization techniques: Southern, Northern & Western Blotting. Physical and Chemical mutagens, Carcinogenicity testing (AMES Test) - Applications of Mutations.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination) prokaryotic and eukaryotic replication, transcription, translation processes and regulation	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. David P. Clark, Nanette J. Pazdernik, Michelle R. McGehee. Molecular Biology (3rd edition), Academic Cell, 2019.
2. Elizabeth A. Allison. Fundamental Molecular Biology (3rd Edition). Wiley-Blackwell, 2021.
3. Bruce Alberts, Rebecca Heald, Alexander Johnson, David Morgan, Martin Raff, Keith Roberts, Peter Walter, John Wilson, Tim Hunt. Molecular Biology of the Cell (7th edition) W. W. Norton & Company, 2022.
4. Rupal Sengar. Textbook of Microbial Genetics (1st edition), LAP LAMBERT Academic Publishing, 2021.
5. Pradeep D. Devkate, Samina R. Khan, Dipak G. Puri, Sachin S. Shinde. A Textbook of Microbial Genetics (1st edition), Booksclinic Publishing, 2023.

Reference Books

1. Hartl, Daniel L. Genetics: Analysis of genes and genomes. (9th Edition), Jones & Bartlett Learning, 2019
2. Arumugam N. Cell Biology and Molecular Biology (9th Edition), Saras Publication, 2019.
3. Poonam Agrawal, Lippincott Illustrated Reviews: Cell and Molecular Biology (SAE- 2nd edition), WoltersKluwer India Pvt Ltd, 2022.
4. Jordanka Zlatanova. Molecular Biology: Structure and Dynamics of Genomes and Proteomes (2nd Edition), Garland Science, 2022.
5. Joanne Willey, Kathleen Sandman, Dorothy Wood. Prescott's Microbiology (12th edition), Mc Graw Hill, 2022.
6. Bernard R. Glick , Cheryl L. Patten. Molecular Biotechnology: Principles and Applications of Recombinant DNA (ASM Books) (6th Edition). ASM Press, 2022.

Web References

1. <http://www.freebookcentre.net/Biology/Molecular-Biology-Books.html>
2. http://www.freebookcentre.net/medical_text_books_journals/genetics_ebooks_onlinetext_sdownload.html
3. <https://www.nature.com/scitable/ebooks/>
4. http://www.digitalbookindex.org/_search/search010biolmolecularcellbiologya.asp
5. <https://microbenotes.com/dna-structure-properties-types-and-functions/#types-of-dna>
6. <https://www.biologydiscussion.com/dna/dna-damage-types-and-repair-mechanisms-with-diagram/16332>
7. <https://www.biologydiscussion.com/gene/transposons-or-jumping-genes-types-structure-mechanism-and-functions/16499>

Pedagogy

Power point presentations, Group Discussion, Seminar, Quiz, Assignment.

Course Designer

Dr.V.Aruna

Semester: V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB5CC5P	MEDICAL MICROBIOLOGY, AGRICULTURAL MICROBIOLOGY AND MOLECULAR BIOLOGY (P)	CORE PRACTICAL	3	3

Course Objective

To impart the knowledge on isolation, identification of medically important organisms and perform water and soil analysis and isolation of chromosomal and plasmid DNA.

Prerequisites

To acquire a Skills about the various Techniques Medical Microbiology, Agricultural Microbiology and Molecular Biology.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive level
CO 1	Illustrate the isolation procedures	K2
CO 2	Explain the symptoms of diseases	K2
CO 3	Sketch out the water borne microbes	K3
CO 4	Demonstration of auxotrophic mutants	K3
CO 5	Analyze agarose gel electrophoresis	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	3	2	2	2	3
CO2	3	2	3	3	2	3	2	2	3	3
CO3	3	3	3	2	3	3	3	3	3	2
CO4	3	3	2	3	2	3	2	2	3	2
CO5	3	3	3	2	3	3	3	3	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no Correlation

MEDICAL MICROBIOLOGY (25 Hours)

1. Isolation of bacterial flora of skin by swab method.
2. Isolation of bacteria from urine, stool and sputum.
3. Identification of Gram-positive organisms (using laboratory strains): *Streptococcus pneumoniae*, *Staphylococcus aureus* and *Bacillus sp.* and Gram-negative organisms (using laboratory strains): *Escherichia coli*, *Proteus sp.* and *Klebsiella pneumoniae* on the basis of microbiological, cultural and biochemical characteristics.
4. Saline and iodine wet mount to demonstrate protozoan parasites
5. Giemsa staining for the demonstration of blood parasites
6. KOH and Lactophenol cotton blue mount to demonstrate fungi.
7. Antibacterial sensitivity test – Kirby- Bauer method.

AGRICULTURAL MICROBIOLOGY (10 Hours)

8. Water analysis by MPN technique – presumptive coliform test – confirmed coliform test and completed coliform test.
9. Microbial assessments of air quality – open plate method and air sampler technique.
10. Isolation and counting of faecal bacteria from water.
11. Soil Analysis -pH, chlorides, nitrate, calcium, magnesium and total phosphorus.
12. Isolation of cyanobacteria from water.
13. Isolation of *Rhizobium* from legume nodule.
14. Isolation of phosphobacteria from soil.
15. Observation of VAM from plant root.

MOLECULAR BIOLOGY (10 Hours)

16. Isolation of Chromosomal DNA from bacteria
17. Isolation of Plasmid DNA from bacteria
18. Isolation of Auxotrophic mutants.
19. Demonstration of Bacterial transformation technique.
20. Demonstration of Agarose gel electrophoresis (to study DNA/ RNA) and SDS – PAGE (to study proteins).

Reference Books

1. Ananthanarayan, Paniker (2020), Textbook of Microbiology, Universities Press.
2. SubbaRao NS (2020), Soil Microbiology, Oxford Publishing.
3. Mangesh Y Dudhe , (2020), Agriculture- Microbiology, New Vishal Publications.
4. Michael J Leboffe and Burton E Pierce (2019). Microbiology: Laboratory Theory & Application, Morton Publishing Company..
6. Ashwani Kumar, Gakhar S K and Monika Miglani (2019), Molecular Biology: A Laboratory Manual, Dreamtech Press

Web References

1. https://www.mlsu.ac.in/econtents/159_Experiment.%204_Isolation%20bacteria%20from%20skin.pdf
2. <https://microbenotes.com/water-quality-analysis-by-most-probable-number-mpn/>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5577976/>
4. <https://www.cdc.gov/dpdx/diagnosticprocedures/stool/microexam.html>
5. <https://www.youtube.com/watch?v=k2xx7jIW3E8>

Pedagogy

Power point presentations, Group Discussion, Quiz, Brain Storming Activity.

Course Designer

Dr.V.Aruna

Semester V	Internal Marks : 25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT
22UMB5DSE1A	ORGANIC FARMING	DISCIPLINE SPECIFIC ELECTIVE (DSE)	5	4

Course Objectives

This course focuses on the need and generating knowledge and skill on various organic farming practices, so as to carry out organic agricultural production and management system that sustains the health of soils and ecosystems.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge level
CO1	Determine the origin and importance of organic farming	K1,K2,K4
CO2	Explain the scope of organic farming	K2,K3,K4
CO3	Evaluate the methodology practiced in organic farming	K4,K5,K6
CO4	Generalize the management strategies in crop protection	K3,K4,K6
CO5	Compile the strategies for the commercialization of organic products	K5,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	2	3	3	3	3	2	3
CO2	3	2	3	3	2	2	3	2	3	3
CO3	3	2	2	3	3	3	2	3	3	2
CO4	2	3	3	2	3	3	3	2	3	2
CO5	3	3	2	3	2	3	3	3	2	2

“1” – Slight (Low) Correlation“

“3” – Substantial (High) Correlation

2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Concept, Principles and development of organic farming. Types - Natural farming- Biodynamic farming. Conventional farming v/s Organic farming.	16	CO1, CO2, CO3 CO4, CO5	K1, K2, K3, K4, K5
II	Scope of organic farming: requirements for organic farming. Organic nutrients resources and their management, organic ecosystems and their concepts- Bioinoculants.	14	CO1, CO2, CO3 CO4, CO5	K1, K2, K3, K4, K5
III	Composting: principles – stages - types and factors. Composting methods – Vermicomposting. Biofertilizers - methods of application, advantages and limitations.	13	CO1, CO2, CO3 CO4, CO5	K1, K2, K3, K4, K5
IV	Plant protection: Insect Pest and disease management in organic farming- biopesticides, - biocontrol agents, Weed management in organic farming- preventive practices, biological control of weeds- mechanical control.	16	CO1, CO2, CO3 CO4, CO5	K1, K2, K3, K4, K5
V	Organic crop production, certification process and standards of organic farming in India, economic viability of organic farming, marketing and export potential of organic products.	16	CO1, CO2, CO3 CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Plant Nutrients-Micro and Macro, Importance and deficiency syndrome, crop rotation : need and benefits		CO1, CO2, CO3 CO4, CO5	K1, K2, K3, K4, K5

Text books

1. Maliwal P L (2020). Principles of Organic Farming, Scientific Publisher
2. Joanne M Willey, Kathleen M Sandman and Dorothy H Wood (2019). Prescotts Microbiology, McGraw-Hill Education
3. Joanne M Willey, Kathleen M Sandman and Dorothy H Wood (2019). Prescotts microbiology, McGraw-Hill Education
4. Unni M R and Sabu Thomas (2018). Organic Farming Global Perspectives and Methods, Woodhead publishing
5. Amitava Rakshit and H B Singh (2018). ABC of Organic Farming, Jain Brothers

Reference books

1. Bansal M (2020). Basics of Organic Farming, CBS publishers and Distributors Pvt. Ltd.
2. Janet Wilson (2020). Composting: Sustainable and Low- Cost Techniques for Beginners, Drip Digital Publisher
3. Debabrata Biswas, Shirley A. Micallef (2019). Safety and Practice for Organic Food Academic press, Elsevier Science.
4. Rhonda Sherman (2018). The Worm Farmer's Handbook Chelsea Green Publishing Company
5. Vinaya Kumar Sethi (2018). Organic farming and bio-fertilizers, Discovery publishing house Pvt. Ltd.

Web References

1. <http://agrimoon.com/organic-farming-pdf-book/>
2. <https://www.britannica.com/topic/organic-farming>
3. https://agritech.tnau.ac.in/org_farm/orgfarm_introduction.html
4. https://agritech.tnau.ac.in/org_farm/orgfarm_vermicompost.html
5. https://agritech.tnau.ac.in/org_farm/IPM%20Booklet%20for%20OF-Dr.P.D.pdf
6. https://agritech.tnau.ac.in/org_farm/orgfarm_oc%20guidelines.html

Pedagogy

Power Point Presentations, Group Discussion, Seminar, Quiz, Assignment and Brain Storming Activity

Course Designer

Dr.B.Thamilmaraiselvi

Semester: V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	Credits
22UMB5DSE1B	MEDICAL PARASITOLOGY	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives

To enable the students to understand the clinically important protozoa, helminths and arthropods and acquire knowledge about the areas in which parasitic infections are endemic.

Prerequisites

Basic knowledge and concepts of clinically important parasites

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define and understand diagnostic techniques in parasitology	K1, K2
CO2	Analyze and explain clinical significance of <i>Entamoeba histolytica</i>	K3, K4
CO3	Determine and apply the treatment of <i>Leishmania donovani</i>	K3, K4
CO4	Evaluate and categorize the <i>Plasmodium</i> spp.	K4, K5
CO5	Criticize and manage <i>Taenia solium</i>	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	1	3	2	3	3	2
CO2	2	2	2	2	2	3	2	3	2	2
CO3	2	3	1	2	3	3	2	3	2	2
CO4	3	2	3	2	2	3	2	3	2	1
CO5	3	3	3	3	2	3	2	3	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction and Classification of Parasites – Protozoa and helminthic infection. Laboratory Diagnostic Techniques in Parasites – Direct Identification and Indirect Identification. Concentration methods - flotation techniques and sedimentation techniques	15	CO1, CO2, CO3	K1, K2, K3, K4
II	Amoebae: Morphology, Clinical Significance, Symptoms, Pathogenicity, Lab Diagnosis, Treatment and Prevention - <i>Entamoeba histolytica</i> , <i>Acanthamoeba</i> spp. and <i>Naegleria fowleri</i>	15	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
III	Flagellates: Morphology, Clinical Significance, Symptoms, Pathogenicity, Lab Diagnosis, Treatment and Prevention - <i>Giardia intestinalis</i> , <i>Leishmania donovani</i> , <i>Trypanosoma</i> spp.	15	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,
IV	Sporozoans: Morphology, Clinical Significance, Symptoms, Pathogenicity, Lab Diagnosis, Treatment and Prevention - <i>Toxoplasma gondii</i> , <i>Plasmodium</i> spp and <i>Cryptosporidium</i> sp.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6,
V	Cestodes and Nematodes: Morphology, Clinical Significance, Symptoms, Pathogenicity, Lab Diagnosis, Treatment and Prevention – <i>Taenia solium</i> , <i>Ancylostoma duodenale</i> and <i>Wuchereria bancrofti</i> .	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Isolation, identification, clinical manifestations of medically important parasites	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Apurba S Sastry, Sandhya Bhat. (2018). Essentials of Medical Parasitology. 2nd Edition. Jaypee Brothers Medical Publishers.
2. Sougata Ghosh. (2021). Paniker's Text book of Medical Parasitology. 9th Edition. Jaypee Brothers Medical Publishers.
3. Nagoba, B.S. (2020). Medical Microbiology and Parasitology: Prep Manual for Undergraduates, 4th Edition. Elsevier India.
4. Baveja, V. and Baveja, C.P. (2019). Medical Parasitology. 4th Edition. Arya Publishing Company.
5. Sumeeta Khurana, Abhishek Mewara. (2021). Textbook of Medical Parasitology. 1st Edition. Universities Press India Pvt. Ltd

Reference Books

1. Nanda Maheshwari. (2022). Clinical Microbiology & Parasitology for DMLT Students. 4th Edition. Jaypee Brothers Medical Publishers.
2. Arora. D.R. (2020). Medical Parasitology. 5th Edition. CBS Publisher.
3. Shyamasundari, K. and Hanumantha Rao. K. (2021). Medical Parasitology. 1st Edition. MJP Publishers.
4. Rajan, S. and Selvi Christy, R. (2018). Essentials of Microbiology. 4th Edition. CBS Publishers and Distributors Pvt. Ltd.
5. Joanne M. Willey, Kathleen M. Sandman and Dorothy H. Wood (2022). Prescott's Microbiology. 12th Edition. McGraw-Hill Education.
6. Apurba S Sastry and Sandhya Bhat. (2022). Essentials of Medical Microbiology. 4th Edition. Jaypee brothers med Pub Pvt Ltd.

Web References

1. <https://byjus.com/biology/parasites-symbiosis/>
2. https://www.brainkart.com/article/Parasite-and-Host_41024/
3. <https://byjus.com/biology/entamoeba-histolytica-life-cycle/>
4. <https://microbenotes.com/giardia-duodenalis/>
5. <https://www.onlinebiologynotes.com/plasmodium-falciparum-morphology-life-cycle-pathogenesis-and-clinical-disease/>
6. [https://www.meduniwien.ac.at/hp/fileadmin/tropenmedizin/Lehre/Helminths and Helminthiasis Kompatibilitaetsmodus.pdf](https://www.meduniwien.ac.at/hp/fileadmin/tropenmedizin/Lehre/Helminths_and_Helminthiasis_Kompatibilitaetsmodus.pdf)

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment, Brain Storming Activity.

Course Designer

Dr. S. Jenny

Semester: V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	Credits
22UMB5DSE1C	FUNDAMENTALS OF BOTANY AND ZOOLOGY	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objective

To gain the basic knowledge about plants and animals. To impart knowledge on botanical nomenclature, classifications, merits and demerits of various systems of classifications. To understand the systematic of the selected families of the flowering plants with their economic importance. To help our students to distinguish various animal kingdoms to know the evolutionary sequence of them.

Course Outcome and Cognitive Level Mapping:

CO Number	CO Statement	Cognitive level
CO 1	State the Basic knowledge of Plant Nomenclature	K1,K2
CO 2	Describe the Salient features and Economic importance of Monocot and Dicot Plants	K2,K4
CO 3	Illustrate the views of Plant Physiology and Reproduction	K2,K3
CO 4	Prepare Animal Kingdom and Reproduction	K3,K
CO 5	Prepare the Process of Animal Cell reproduction	K3,K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	2	3	3	3	2
CO2	2	3	3	3	3	3	3	2	2	3
CO3	3	3	3	3	2	2	2	3	3	2
CO4	3	3	3	2	2	3	3	3	2	3
CO5	3	3	2	2	3	2	2	2	3	3

1- Slight (Low) correlation 2- Moderate (Medium) correlation
 3- Substantial (High) correlation “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Binomial Nomenclature: ICBN rules – taxonomic types, systems of Classification – Phylogenetic Artificial and Natural. Bentham and Hooker classification - merits and demerits. Plant taxonomy, Plant Nomenclature - Forms of Scientific names. Technical description of flower and floral diagram.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	General characteristics and economic importance: Algae, Fungi, Lichens, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Plant Physiology: Photosynthesis, Respiration and Transpiration. Reproduction of plants in Angiosperms - Vegetative, Asexual and Sexual.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Taxonomy and outline classification of Animal Kingdom: Invertebrates - Prolifera, Cnidaria, Worms, Echinoderms, Molluscs and Arthropods. Vertebrates - Mammals, Birds, Reptiles, Fish and Amphibians. Darwin's and Lamarck's theory of evolution.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,
V	Animal Physiology: Digestive, Respiratory, Circulatory, Excretion and Nervous system. Cell division – Mitosis and Meiosis.	15	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4, K5,
VI	Self Study for Enrichment (Not included for End Semester Examination) Darwin's and Lamarck's theory of evolution.	-	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4, K5,

Text Books

1. Kishore R Pawar and Ashok E Desai (2020) An Introduction to Zoology, Nirali Prakashan Press.
2. Sunidhi Miglani (2016) Text Book of Economic Botany, ABS Publications.
3. Kotpal R L (2016) Modern text book of Zoology, Rastogi Publications.
4. Afroz Alam (2015) Textbook of Botany, I K International Publishing House Pvt. Ltd.
5. Nanda A K (2015) Text Book of Botany, Kitab Mahal – Cuttack.

Reference Books

1. James Bidlack and Shelley Jansky (2020) Plant Biology, McGraw-Hill Education.
2. James D Mauseth (2019) An introduction to plant biology, Jones & Bartlett Learning.
3. Smithsonian (2019) Zoology, DK; Illustrated edition.
4. Stephen Miller and Todd A. Tupper (2018) Zoology, McGraw-Hill Education.

Web References

1. <https://www.biologydiscussion.com/plant-taxonomy/quick-notes-on-plant-taxonomy/47582>
2. <https://www.studyandscore.com/studymaterial-detail/international-code-of-botanical-nomenclature-icbn-history-principles-and-aim>
3. <https://byjus.com/biology/plant-physiology/>
4. <https://www.slideshare.net/mjnepa/cell-reproduction-notes>
5. <https://biologywise.com/vertebrates-invertebrates>

Pedagogy

Power Point Presentations, Group Discussion, Seminar, Quiz, Assignment and Brain Storming Activity.

Course Designer

Dr. E.Priya

Semester: V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	CREDITS
22UMB5SEC2P	BIOFERTILIZER TECHNOLOGY (P)	SKILL ENHANCEMENT COURSE	2	2

Course Objectives

To enable the students to understand the importance of biofertilizers in agriculture and production technologies.

Prerequisites

Basic knowledge and concepts of Biofertilizer production technologies.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define and understand Biofertilizers and Production technology	K1, K2
CO2	Analyze and explain mass production methods of Symbiotic Biofertilizers	K3, K4
CO3	Determine and apply Non- Symbiotic Biofertilizers cultivation methods	K3, K4
CO4	Evaluate and categorize Phosphate solubilizing bacteria cultivation methods	K4, K5
CO5	Criticize and manage Mycorrhizae and Carrier based inoculum production methods	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	1	3	2	3	3	2
CO2	2	2	2	2	2	3	2	3	2	2
CO3	2	3	1	2	3	3	2	3	2	2
CO4	3	2	3	2	2	3	2	3	2	1
CO5	3	3	3	3	2	3	2	3	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

BIOFERTILIZER TECHNOLOGY (P)

1. Isolation, identification and cultivation of *Rhizobium* from leguminous plant roots
2. Isolation, identification and cultivation of *Azospirillum*
3. Isolation, identification and cultivation of *Azotobacter*
4. Isolation, identification and cultivation of Cyanobacteria from paddy field soil and water.
5. Isolation, identification and cultivation of *Azolla*.
6. Isolation, identification and cultivation of Phosphate solubilizing bacteria from soil.
7. Isolation, identification and cultivation of Mycorrhizae (VAM)
8. Preparation of carrier based and liquid based inoculums.

Text Books:

1. Krishnendu Acharya, Surjit Sen & Manjula Rai. (2019). Biofertilizer and Biopesticide. 1st Edition. Techno World.
2. S. Rajan & R. Selvi Christy. (2018). Experimental Procedures in Life Sciences. CBS Publications
3. Reeta Khosla. (2017). Biofertilizers and Biocontrol Agents for Organic Farming. 1st Edition. Kojo Press
4. Hyma. (2017). Biofertilizers: Commercial Production Technology and Quality Contrtol. 1st Edition. Random Publications.
5. Anil K Thakur, Susheel K Bassi, Kamajit Singh, Dinesh. (2020). Biofertilizers (Skill Enhancement course). 1st Edition. S Dinesh & Co.

Reference Books:

1. Rao B.N.S. (2019). Biofertilizers in Agriculture and Forestry. 3rd Edition. Oxford & IBH Publishing House.
2. Sharma R.A. (2019). Biofertilizer Technology. 1st Edition. Agro tech Publishing Academy.
3. Ameta O.P and Sharma U.S. (2018). Biopesticides for Sustainable Agriculture. 1st Edition. Agro tech Publishing Academy.
4. Somani L. (2018). Biofertilizers: Commercial Production Technology and Quality control. 1st Edition. Agrotech Publishing Academy.
5. Subha Rao N.S. Biofertilizers in Agriculture and Forestry. 4th Edition. Medtech scientific International Pvt Ltd.

Weblinks:

1. https://agritech.tnau.ac.in/ta/org_farm/orgfarm_biofertilizers.html
2. https://agritech.tnau.ac.in/org_farm/orgfarm_biofertilizertechnology.html
3. <http://www.techno-preneur.net/technology/new-technologies/food-agro/vam-fungi.html>
4. http://14.139.187.9/ta/org_farm/orgfarm_faq's.html
5. <https://www.iihr.res.in/large-scale-production-vesicular-arbuscular-mycorrhizal-fungi-finger-millet>
6. <https://agriinfo.in/large-scale-production-of-biofertilizers-1932/>
7. https://www.fnca.mext.go.jp/english/bf/bfm/pdf/3_Carriers_for_Biofertilizer0331final.pdf

Pedagogy

Power point presentations, Group Discussion, Quiz, Brain Storming Activity.

Course Designer

Dr. S. Jenny



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG & RESEARCH DEPARTMENT OF MICROBIOLOGY

M.Sc., MICROBIOLOGY – Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2023-2024 and onwards)

SEMESTER II

Semester	Course	Title	Course Code	Inst. Hrs/ Week	Credits	Exam			Total
						Hrs	Marks		
							Int.	Ext.	
II	Core Course – IV (CC)	Bacteriology and Mycology	23PMB2CC4	6	5	3	25	75	100
	Core Course – V (CC)	Immunology and Immunotechnology	23PMB2CC5	6	5	3	25	75	100
	Core Choice Course – I (CCC)	A. Microbial Metabolism	23PMB2CCC1A	5	4	3	25	75	100
		B. Microbial Physiology	23PMB2CCC1B						
		C. Microbial Growth and Nutrition	23PMB2CCC1C						
	Core Practical – II (CP)	Bacteriology, Mycology, Immunology and Immuno technology(P)	23PMB2CC2P	9	5	3	25	75	100
	Discipline Specific Elective Course – II	A. Medical Microbiology	23PMB2DSE2A	4	3	3	25	75	100
		B. Public Health Microbiology	23PMB2DSE2B						
		C. Medical Parasitology	23PMB2DSE2C						
	Internship	Internship	23PMB2INT	-	2	-	-	100	100
		Total	30	24				500	

15 Days INTERNSHIP during Semester Holidays

Semester: II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23PMB2CC4	BACTERIOLOGY AND MYCOLOGY	CORE COURSE	6	5

Course Objectives

To understand the basic information on bacterial and fungal disease. Important knowledge on host and parasitic infections. Create knowledge on the infection caused by the organism. To understand the pathogenesis of bacterial and fungal diseases.

Prerequisites

Apply their acquired knowledge on laboratory techniques on diagnosis of bacterial and fungal disease.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Determine the host – parasite relationship	K2,K3,K4
CO2	Diagnose the various bacterial pathogens	K3,K4
CO3	Illustrate the <i>Chlamydia trachomatis</i>	K4,K5
CO4	Describe and Classify the various fungi and its Characterization	K5,K6
CO5	Discuss the fungal diseases	K1,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	2	2	3	2
CO2	3	3	2	2	2	3	3	2	3	3
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to normal flora: Indigenous normal microbial flora of human body. General attributes and virulence factors of bacteria causing infections. Host Parasite relationships – Nonspecific host immune mechanisms. Ground rules for collection and dispatch of clinical specimens for microbiological diagnosis and discarding of clinical Specimens.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3, K4 K5, K6
II	Bacteriology: Morphology, cultural characteristics, pathology, laboratory diagnosis and prevention , Control and treatment of diseases caused by the Following organisms: <i>Staphylococci aureus</i> , <i>Streptococci pyogens</i> , <i>Pneumococci</i> , <i>Neisseriae (Gonococci & Meningococci)</i> , <i>Corynebacterium diptheriae</i> , <i>Mycobacterium tuberculosis</i> , <i>M. leprae</i> , <i>Clostridium tetani</i> ,	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	Bacteriology: Morphology, classification, cultural characteristics, pathogenicity, pathology, Laboratory diagnosis and prevention, Control and treatment of diseases caused by the Following organisms: <i>Salmonella</i> , <i>Shigella dysenteriae</i> , <i>Vibrio cholerae</i> , <i>E.coli</i> , <i>Pseudomonas aeruginosa</i> , <i>Haemophilus influenza</i> , <i>Helicobacter pylori</i> , <i>Rickettsia rickettsi</i> , <i>Chlamydiae trachomatis</i> .	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
IV	Mycology: Classification of medically important Fungi (Morphology, Infection & Reproduction), Immunity to Fungal Infections. Culture Media and Stains in Mycology, Normal fungal flora of human beings, Specimen collection, preservation, Transportation & Identification of Mycological Agent. Biochemical tests for fungal identification, Anti-fungal agents-sensitivity test.	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6

V	Mycology: Morphology, classification, cultural characteristics, pathogenicity, pathology, Laboratory diagnosis and prevention, Control and treatment of diseases caused by the Following organisms: Pityriasis vesicolor, White piedra, Black piedra, Tinea nigra, Cutaneous Mycosis - Dermatophytes. Subcutaneous Mycosis Mycetoma and Sporotrichosis. Systemic Mycosis-Histoplasmosis and Blastomycosis, Opportunistic Mycosis – Cryptococcus neoformans. Miscellaneous Mycosis-Otomycosis .	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
VI	Self-Study for Enrichment (Not included for End Semester Examinations) Ground rules for collection and dispatch of clinical specimens for microbiological diagnosis and discarding of clinical Specimens.Culture Media and Stains in Mycology, Normal fungal flora of human beings, Specimen collection,	-	CO1, CO2, CO3,	K2 K3 K4 K5

Text Books

1. Michael T. Madigan, John M. Martinko, Kelly S. Bender, Daniel H. Buckley And David A. Stahl, Pearson.(2015). Brock Biology Of Microorganisms, Fourteenth Edition, Pearson, Boston.
2. Joanne, M. Willey, Linda, M. Sherwood, Christopher, J. Woolverton And Chris Woolverton, Mc Graw Hill. (2011). Prescott, Harley, And Klein's Microbiology, Eighth edition.
3. De Vos P.(2012). Bergey's Manual of Systematic Bacteriology: Volume 3: The Firmicutes, Springer, Second Edition, Newdelhi
4. Alexopoulos, C.J, Mims, C.W, Blackwell, M.(2007). Introductory Mycology, Fourth Edition, Wiley & Sons.
5. Aneja, K.R and Mehrotra, R.S.(2018). An Introduction to Mycology, New Age International (P) Ltd., Publishers.

Reference Books

1. Griffiths, A. B.(2019). A Manual of Bacteriology, Forgotten Books.
2. Edgar M Crookshank,(2018). Manual of Bacteriology, Forgotten Books.
3. Arora and Brij Bala Arora. (2019). Medical Mycology, Second Edition, CBS.
4. Hait.(2017). A Textbook of Mycology, New Central Book Agency (NCBA); 1st edition, India.

Web References

1. http://www.rvskvv.net/images/General-Bacteriology_23.04.2020.pdf
2. <https://www.eolss.net/sample-chapters/C03/E5-25-48.pdf>
3. <https://www.vnmueu.edu.ua/downloads/microbiology/20131218-135731.pdf>
4. https://www.uobabylon.edu.iq/eprints/publication_1_13183_803.pdf
5. <https://www.microrao.com/micronotes/mycology.pdf>

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion and Quiz.

Course Designer

Dr.E.Priya

Semester: II	Internal Marks:25		External Marks:75	
COURSECODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB2CC5	IMMUNOLOGY AND IMMUNOTECHNOLOGY	CORE COURSE	6	5

Course Objective

The students will acquire the competency to serve as future teachers, trainers and researchers in the field.

Prerequisites

Understand and critically analyze the literature in the field of Immunology and its technical aspects in the field of Immunology.

Course Outcome and Cognitive Level Mapping.

CO Number	CO Statement	Cognitive Level
CO1	Explain the basics of immunology	K2
CO2	Illustrate the hypersensitivity reaction	K3
CO3	Categorize autoimmunity and autoimmune disease	K4
CO4	Interpret trans plantation and tumor immunology	K5
CO5	Discuss molecular immunology and immune diagnosis	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	2	3	2	3	3	3	3	3	3	3
CO3	3	2	3	3	2	3	3	3	3	2
CO4	3	3	3	3	3	3	3	3	2	3
CO5	3	3	3	2	3	3	2	3	3	3

1-Slight (Low)correlation

2-Moderate (Medium)correlation

3-Substantial (High) correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Basic Immunology: History of Immunology, Types of Immunity, Cells and organs involved in immune system (T-cells, B-cells, lymphoid organ, spleen and bone marrow), immune responses – cell mediated and humoral, Antigens, Cytokine, Haptens, adjuvants, Antibodies: their structure and functions, Complement system, Antigen processing cells, Classes of Immunoglobulin (IgA,IgG,IgD, IgM and IgE).	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
II	Hypersensitivity reaction: IgE-mediated (type-I), Ab-mediated cytotoxic (type-II), Immune complex mediated (type-III) and Delayed type hypersensitivity (type-IV).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Autoimmunity and autoimmune disease: Organs specific autoimmune disease – Hashimoto's thyroiditis, Good pastures syndrome, Insulin dependent diabetes mellitus, Myasthenia gravis. Systemic autoimmune disease – systemic lupus erythematosus (SLE), Multiple sclerosis, Rheumatoid arthritis.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Transplantation and Tumor immunology: Transplantation and its classification, Immunologic basis of graft rejection and its Mechanism, Transplantation antigens, tissue typing role of MHC molecules in allograft rejection and immune suppressive therapy. Tumors of the immune system, tumor antigens and immune response to tumors, detection of tumor markers and tumor immunotherapy.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Molecular Immunology and Immuno diagnosis: Antigen antibody interaction – Precipitation reactions, Agglutination reactions, ABO Blood typing principles. Principles and applications of ELISA, Radio Immuno Assay, western blot analysis, immune electrophoresis- double immuno assay, rocket immune assay, Immuno fluorescence and chemi luminescence Assay.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	UNIT VI – Self study for Enrichment (Not included for End Semester Examination) Immunological memory, Non-allergic hypersensitivity, Nutrition and autoimmunity, Advances in tumor immunology and fluorescence activated cell sorting (FACS) Analysis.	-	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4, K5, K6

Text Books

1. Coico R. and Geoffrey S. (2015) *Immunology: A Short Course. 7th Edition*. Wiley-Blackwell.
2. Singh R.P. (2015) *Immunology and Medical Microbiology. 2nd Edition*. Kalyani Publishers, New Delhi.
3. Talwar C.P. and Gupta S. K. (2017) *Hand Book of Practical and Clinical Immunology*. CBS Publishers & Distributors.
4. Shyamasree G. (2021) *Immunology and Immunotechnology. 2nd Edition*. Books & Allied Pvt. Ltd.
5. Gupta S.K. and Goswami B. (2021) *Immunology for MBBS*. APC Books.
6. Misbah S.A., Spickett G.P. and Dalm V.A.S.H. (2022) *Chapel and Haeney's Essentials of Clinical Immunology. 7th Edition*. Wiley-Blackwell.

Reference Books

1. Sudha G. and Shubhangi S. (2013) *Textbook of Basic and Clinical Immunology*. Universities Press (India) Pvt. Ltd.
2. Rich R., Fleisher T., Shearer W., Schroeder H., Frew A. and Weyand C. (2018) *Clinical Immunology: Principle and Practice*. Elsevier.
3. Abbas A.K., Lichtman A.H. and Pillai S. (2019) *Basic Immunology (Functions and Disorders of the Immune System). 6th Edition*. Elsevier.
4. Punt J. (2019) *Kuby Immunology. 8th Edition*. Mac millan Learning.
5. Ian C Clift. (2020) *Clinical Immunodiagnostics: Laboratory Principles and Practices*. Jones & Bartlett Publishers.
6. Chakravarty A.K. (2021) *Immunology and Immunotechnology*. Oxford University Press.

Web References

1. <https://www.jaypeedigital.com/eReader/chapter/9788184480610/ch1>
2. <https://www.ncbi.nlm.nih.gov/books/NBK562228/>
3. <https://www.healthline.com/health/autoimmune-disorders>
4. <https://www.slideshare.net/MMASSY/transplantation-and-tumor-immunology>
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7474384/>

Pedagogy

Chalk and talk, PowerPoint Presentation, Quiz, Assignments, Group Discussions, Seminar, Assignment.

Course Designer

Dr. V. Aruna

Semester: II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB2CCC1A	MICROBIAL METABOLISM	CORE CHOICE COURSE	5	4

Course Objectives

This course deals with how to make microbes differentiate based on the metabolism and describe how microbes do catabolism to get energy and metabolism to build structure.

Prerequisites

Basic knowledge on Physiological processes of Microbes.

Course Outcome and Cognitive Level Mapping

CONumber	CO Statement	Cognitive Level
CO1	Define and understand the basic concepts of metabolism	K1,K2
CO2	Explain and analyze about the growth phases of Microbial populations	K3, K4
CO3	Analyze about Microbial respiration	K3, K4
CO4	Criticize about bacterial photosynthesis	K5, K6
CO5	Assess about microbial biosynthesis	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	2	2	2	3	3	2	2
CO2	3	2	3	2	3	3	3	3	3	2
CO3	3	2	2	2	3	3	2	2	2	2
CO4	2	2	2	3	2	3	2	2	2	2
CO5	2	3	2	2	3	3	3	3	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Metabolism -Definition - Anabolism versus Catabolism. Metabolic pathways – Linear, irreversible and branched metabolic pathways. Mechanisms of enzyme reaction – the role of ATP, reducing power and precursor metabolites in metabolism. Biochemical mechanisms of generating ATP. Components of electron transport chains - NAD, NADP, FAD, FMN, Coenzyme-Q, Cytochromes..	15	CO1, CO2, CO3	K1, K2, K3, K4,
II	Microbial Growth - Phases of growth, Growth kinetics - batch culture, continuous culture and synchronous culture - induction of synchrony. Factors affecting growth - nutrition, aeration, temperature and pH. Physiological adaptation to extreme environmental conditions. Nutritional types - types based on carbon, energy and electron sources. Measurement of cell numbers, cell mass	15	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
III	Respiration - Aerobic respiration: glycolysis, Pentose Phosphate pathway, TCA cycle. Glyoxylate cycle. Respiratory electron transport in mitochondria and bacteria. Anaerobic respirations: sulfate, nitrate, carbonate respirations and their ecological significance.	15	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
IV	Bacterial Photosynthesis - Brief account of photosynthesis – oxygenic and anoxygenic photosynthesis. fixation of CO ₂ - Calvin cycle - C ₃ -C ₄ pathway. Chemo lithotrophic oxidations - Sulfur, Iron, Hydrogen and Nitrogen oxidations. Methanogenesis, Basic aspects of bioenergetics – entropy, enthalpy, equilibrium constant, artificial electron donors, inhibitors, uncouplers, energy bond, phosphorylation.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

V	Microbial Biosynthesis -Biosynthesis of Peptidoglycan, Amino acids, Fatty acids, Vitamins – Biosynthesis of Poly Hydroxy Alkanoate (PHA) and Poly Hydroxy Butyrate (PHB)	15	CO1, CO2, CO3, CO4 , CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Bioluminescence: Bioluminescent bacteria and its importance. Biochemistry of Luciferin- Luciferase along with the lux operon (genes).	-	CO1, CO2, CO3, CO4 , CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Satyanarayana, U. and Chakrapani, U. (2013) Biochemistry, Fourth Edition. Book and Allied Pvt, Kolkata.
2. Stryer L. (2010) Biochemistry Seventh Edition. W.H. Freeman and Company, New York.
3. Monika Rustugi (2016). Bacterial Metabolism . Meditech.
4. Anadhi, D. (2014). Introduction to Biochemistry and Metabolism. Pearson Education India

Reference Books

1. [Tyrrell Conway](#), [Paul S. Cohen](#). (2015) Metabolism and Bacterial Pathogenesis. ASM Press.
2. Rabus, R. (Oldenburg) Saier Jr., M.H. (La Jolla, CA. (2022). Microbial Physiology. Karger Publication.
3. Walid EI Sharoud. (2011). Bacterial Physiology: A Molecular Approach. Springer.
4. G.N.Cohen.(2011). Microbial Biochemistry. Springer.

Web References

1. <https://download.e-bookshelf.de/download/0000/5838/44/L-G-0000583844-0002360696.pdf>
2. <https://www.perlego.com/book/2771785/microbial-physiology-pdf>
3. <https://www.slideshare.net/cavoyc/physiology-of-microorganism-1>
4. <https://byjus.com/biology/metabolism/>
5. <https://www.britannica.com/science/metabolism>

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion, Quiz.

Course Designer

Dr.N.Pushpa

Semester : II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23PMB2CCC1A	MICROBIAL PHYSIOLOGY	CORE CHOICE COURSE	5	4

Preamble:

This course will help the students gain knowledge about the Microbial physiology and metabolism by understanding microbial nutrition and growth characteristics. Differentiating concepts of aerobic and anaerobic respiration and how these are manifested in the form of different metabolic pathways in microorganisms.

Course Outcome and Cognitive Level Mapping:

CO Number	CO Statement	Knowledge level
CO1	To impart among the learners the fundamental principles of microbial physiology	K1, K2, K4
CO2	To provide the role / functions of various enzymes of bacterial cell.	K1, K2, K3
CO3	To understand the route of a cell to metabolize carbohydrate, protein and fatty acids.	K1, K2, K3
CO4	To highlight the microbial enzymes' profiles and their activity.	K1, K2, K4
CO5	Attain insight about aerobic respiration and Photosynthesis of Green, Purple bacteria and Cyanobacteria.	K1, K2, K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	3	3	3	3
CO2	2	3	2	3	3	3	3	2	3	3
CO3	3	2	3	3	2	2	3	3	3	2
CO4	3	3	3	3	3	3	3	3	2	3
CO5	2	3	2	2	3	3	2	3	3	2

1- Slight (Low) correlation 2- Moderate (Medium) correlation

3- Substantial (High) correlation “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Microbial nutrition and growth: Nutritional requirements of microbes - Autotrophs, Heterotrophs, Photoautotrophs, Chemoautotrophs, Copiotrophs, Oligotrophs, Factors influencing microbial growth – pH, temperature, substrate and osmotic condition. Bacterial growth curve & importance of the growth phases – Generation time - Growth measurements – batch, continuous and synchronous. Diauxic growth.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5 K6
II	Bacterial enzymes – classification & nomenclature, properties, kinetics of enzyme action – Michaelis-Menton equation for simple enzymes - coenzymes and cofactors, isozymes. Factors affecting enzyme activity.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Anabolism – bacterial photosynthesis – oxygenic – anoxygenic, synthesis of carbohydrate – catabolism of glucose – EMP – HMP – ED pathways, TCA cycle – electron transport system, Phosphorylation, oxidative and substrate level phosphorylations.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Protein metabolism – synthesis and degradation of amino acids – glycine tyrosine, cysteine, serine, glutamine, synthesis of peptides and proteins – urea cycle	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Lipid metabolism – biosynthesis of fatty acids and cholesterol – oxidation of fatty acids. Anaerobic Respiration – Nitrate, sulphate and methane respiration – Fermentations – alcoholic, propionic, mixed acid, lactic acid fermentation.	15	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examination) Anaerobic respiration with special reference to dissimilatory nitrate reduction (Denitrification; nitrate/nitrite and nitrate/ammonia respiration; fermentative nitrate reduction Fermentation-Alcohol fermentation and Pasteur effect.	-	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4, K5, K6

Text Books:

1. Moat G, John W. Foster and Michael P. Spector (2002). Microbial physiology. Fourth edition, A John Wiley sons, Inc. publication. New Delhi.
2. Dubey RC and Maheswari DK (2022). A Text of Microbiology. Revised edition, S. Chand and Company Ltd., New Delhi
3. Namita Gupta, Rani Gupta (2021), Fundamentals of Bacterial Physiology and Metabolism, Springer

7. Rajan S and Selvichristy (2019). Exam Oriented Biochemistry. CBS Publishers, New
8. Delhi
9. Cappucino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited.

References:

1. Nelson David L, Albert L Lehninger and Michael M Cox. Lehninger (2008) Principles of biochemistry. Macmillan.
2. Murray RK, Granner DK, Mayes PA and Rodwell VW. (2004) "Harper's Biochemistry, Appleton and Lange: New York, NY.
3. Dubey, R.C. & D.K. Maheshwari. (2022) A Text Book of Microbiology, S. Chand and Company Ltd., New Delhi.

Web links:

1. <https://www.elsevier.com/books/bacterial-physiology-and-metabolism/sokatch/978-1-4832-3137-2> 14.
2. [https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_\(Bruce_Slind\)/11%3A_Microbial_Nutrition](https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Bruce_Slind)/11%3A_Microbial_Nutrition)
3. <https://microbiologynotes.org/introduction-to-the-microbial-nutrition/>
4. <https://www.youtube.com/watch?v=SCTMQNmZtdw>
5. <https://www.youtube.com/watch?v=VzAjOPzUIP4>
6. <https://www.youtube.com/watch?v=0OMNyVzLnVc>

Pedagogy

Chalk and talk, Power Point Presentation, Quiz, Assignments, Group Discussions, Seminar, and Assignment.

Course Designer

Dr. S. Jeyabharathi

Semester: II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/WEEK	CREDITS
23PMB2CCC1C	MICROBIAL GROWTH AND NUTRITION	CORE CHOICE COURSE	5	4

Course Objective

Understand mechanism of uptake of nutrients in microbial cells. Study the microbial growth and kinetics of growth. Understand influence of environmental factors on microbial growth.

Prerequisite

Basic Knowledge of microbial growth nutrition concepts

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Examine the properties of a good culture medium.	K3,K4
CO2	Determine the microorganisms of Pure culture methods	K4,K5
CO3	Evaluate the nutritional categories of microorganisms on the basis of carbon and energy source	K4, K5
CO4	Illustrate the microbial Transport	K5,K6
CO5	Demonstrate the microbial Growth	K6,K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	2	2	3
CO2	3	3	3	3	2	3	3	3	3	2
CO3	3	2	3	3	2	3	3	3	3	3
CO4	3	3	2	3	3	3	3	3	2	3
CO5	3	3	3	2	3	2	2	3	3	3

“ 1”- Slight (Low) correlation “2”- Moderate (Medium) correlation

“ 3”- Substantial (High) correlation “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Cultivation media: Properties of a good culture medium. General ingredients of culture media and their role. Definition, Concept, Use and Types of different culture media – Living and Non - living media, Synthetic, Non-synthetic, Natural, Selective, Differential, Enriched, Enrichment, Assay, Minimal, Maintenance and Transport Medium and Buffers in culture medium.	15	CO1 CO2 CO3 CO4	K1 K2 K3 K4 K5
II	Pure culture methods: Definitions - pure culture, mixed culture, consortium, axenic culture, contamination. Isolation of microorganisms: Principle and method of isolation-streak plate pour plate, spread plate, single cell isolation. Cultivation of anaerobes: Gas Pak Anaerobic jar.	15	CO1 CO2 CO3 CO4	K1 K2 K3 K4
III	Microbial Nutrition: Major bio-elements: carbon, oxygen, hydrogen, phosphorus, and sulfur. Minor bio-elements: manganese, zinc, cobalt, molybdenum, nickel, and copper. Growth factors - temperature, pH, and osmotic pressure. Sources of energy. Nutritional categories of microorganisms on the basis of carbon and energy source.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6.
IV	Microbial Transport: Modes of nutrition: osmotrophic, phagotrophic. Nutrient transport and membrane function- primary and secondary transport, porins, OMP, carrier proteins. Passive diffusion. Facilitated diffusion. Active transport mechanism. Group translocation.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Microbial Growth: Binary fission, Budding, fragmentation and formation of conidiophores. Mathematical expression of growth. Growth curve and diauxic growth. Measurement of growth: cell number, cell mass and cell activity. Different types of bacterial cultures –Batch culture, continuous culture, synchronous culture.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
VI	Self -Study for Enrichment (Not included for End Semester Examination)	-	CO1 CO2 CO3	K1 K2 K3

	Cultivation of anaerobes: Gas Pak Anaerobic jar, Mathematical expression of growth and OMP.		CO4 CO5	K4 K5

Text Books

1. Albert G. Moat, John W. Foster, Michael P. Spector (2022). *Microbial Physiology*. Wiley-Liss, Inc.
2. Ram Reddy.S and ReddyS.M.(2022). *Microbial Physiology. 2nd Edition* Scientific Publishers.
3. MeenaKumari S (2016). *Microbial Physiology*. Lightning Source Publisher.
4. Rani Gupta, Namita Gupta (2021). *Fundamentals of Bacterial Physiology and Metabolism*. Springer link.
5. Gerhard Gottschalk (2012). *Bacterial Metabolism. 2nd edition*. Springer.

Reference Books

1. Monika Rustagi (2016). *Bacterial Metabolism*. Medtech Publisher.
2. Byung Hong Kim, Geoffrey Michael Gadd (2021). *Bacterial Physiology and Metabolism*. Lightning Source Publisher.
3. Salle AJ. Fundamental principles of Bacteriology, 7th edition, Tata McGraw- Hill publishing company limited, New Delhi. 1996.
4. Doelle HW. Microbial Metabolism, Academic Press. 2005.
5. Lansing M. Prescott JP, Harley and Donald A Klein. Microbiology, 5th edition, McGrawHill Company, New York. 2003. NdukaOkafor. (2011). *Environmental Microbiology of Aquatic and Waste Systems*. Springer Dordrecht Heidelberg London

Web References

1. <https://learn.chm.msu.edu/vibl/content/differential/>
2. https://deogiricollege.org/iqac/science/biotech/Pure_culture_techniques.pdf
3. [https://bio.libretexts.org/Bookshelves/Microbiology/Microbiology_\(Bruslind\)/11%3A_Microbial_Nutrition](https://bio.libretexts.org/Bookshelves/Microbiology/Microbiology_(Bruslind)/11%3A_Microbial_Nutrition)
4. <https://onlinelibrary.wiley.com/doi/book/10.1002/3527600728>
5. https://acikders.ankara.edu.tr/pluginfile.php/140179/mod_resource/content/0/07.pdf

Pedagogy

Chalk and talk, Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

Course Designer

Dr.E.Priya

Semester: II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
23PMB2CC2P	BACTERIOLOGY, MYCOLOGY, IMMUNOLOGY AND IMMUNOTECHNOLOGY(P)	CORE PRACTICAL	9	5

Course Objectives

To impart knowledge about pure culture, staining & Immuno techniques.

Prerequisites

Basic knowledge and concepts of bacteriological, mycological and immunological techniques.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Analyze the Growth nature of organisms	K4
CO2	Assess the staining techniques	K5
CO3	Evaluate on bacterial identification	K5
CO4	Determine ABO blood grouping	K5
CO5	Compiled view of immune techniques	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	3	2	3
CO2	3	2	3	3	2	2	3	2	3	3
CO3	3	2	2	3	3	3	2	3	3	2
CO4	2	3	3	2	3	3	3	2	3	2
CO5	3	3	2	3	2	3	3	3	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“indicates there is no correlation

Syllabus

BACTERIOLOGY, MYCOLOGY

1. Staining of clinical specimens - Wet mount, Differential and Special staining methods.
2. Isolation and identification of bacterial pathogens from clinical specimens - cultivation in basal, differential, enriched, selective and special media - Biochemical identification tests.
3. Antimicrobial sensitivity testing - Kirby bauer method and Stokes method.
4. Minimum inhibitory concentration (MIC) test.
5. Minimum bactericidal concentration (MBC) test.
6. Mounting and staining of VAM spores.
7. Examination of different fungi by Lactophenol cotton blue staining.
8. Examination of different fungi by KOH staining.

IMMUNOLOGY AND IMMUNOTECHNOLOGY

1. Preparation of bacterial antigen by homogenization.
2. Latex agglutination – RF, ASO and CRP.
3. Haem agglutination – Blood grouping and TPHA.
4. Immunodiffusion techniques – single radial, double immunodiffusion techniques.
5. Counter immune electrophoresis.
6. ELISA –HbsAg.
7. Preparation of lymphocytes from peripheral blood by density gradient method.
8. Peripheral blood smear and differential staining.
9. Purification of immunoglobulin by ammonium sulphate precipitation method and SDS-PAGE analysis.
10. Immunochromatography: Demonstration

Reference Books

1. Jacquelyn Black, (2015) Microbiology: Principles and Explorations 9th Edition.
2. Abul Abbas Andrew H. Lichtman, Shiv Pillai, (2014) Cellular and Molecular immunology, 8th edition, Elsevier.
3. Power and Dagainawala, (2012), General Microbiology, Himalaya Publishing House.
4. Power and Dagainawala, (2017), General Microbiology, Himalaya Publishing House, **Vol-II**.
5. Kathleen park Talaro, (2014), Foundations in Microbiology, McGraw Hill. Science, 9th Edition.

Web References

1. <https://universe84a.com/immunochromatographic-test/>
2. <https://www.slideshare.net/AhmedRiyadh17/counter-immunoelectrophoresis>
3. https://www.stma.org/sites/stma/files/pdfs/Alan_Windham_-_Microscopic_Identification_of_Turfgrass_Diseases_STMA.pdf
4. <https://www.iitg.ac.in/biotech/BTechProtocols/RadialImmuno.pdf>
5. <https://www.bioted.es/protocolos/RADIAL-IMMUNODIFFUSION-ENG.pdf>

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion and Quiz.

Course Designer

Ms.S.Sathya

Semester: II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB2DSE2A	MEDICAL MICROBIOLOGY	DISCIPLINE SPECIFIC ELECTIVE COURSE	4	3

Course Objective

Introduce the basic concepts of medical microbiology and Epidemiology
Impart basic knowledge on various types of infection, host parasite relationship and virulence factors associated with the pathogen.

Prerequisites

Basic knowledge and concepts of microbial pathogens and various control measures.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Remember the basics of medical microbiology and Epidemiology	K1
CO2	Understand various types of infection	K2
CO3	Apply to know host parasite relationship and virulence factors associated with the pathogen.	K3
CO4	Analyze diseases caused by bacterial and protozoa	K4
CO5	Evaluate on various viral and fungal diseases	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	3	2	3	2	2	1
CO2	3	3	2	3	3	2	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	2	2	3	2	2	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to medical microbiology Introduction to medical microbiology, Historical background, Classification of medically important microorganisms, Disease cycle, transmission of pathogen and its routes. Host parasite relationship, pathogenicity and virulence in relation with bacteria, Virus, fungi and parasites. Epidemiology and Public Health: Epidemiological principles in prevention and control of diseases; Endemic, epidemic, pandemic and sporadic diseases; Concepts of mortality/ morbidity rates, incidence and prevalence	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5,K6
II	Infection and its types Infections: types of infection, sources of infection, reservoirs and vectors of infection, predisposing factors. Host-parasite relationship governing the infection and establishment of disease. Normal microflora of the human body: Importance of normal microflora, normal microflora of skin, respiratory tract, gastrointestinal tract, urogenital tract, concept of probiotics; Mode of spread of infection; Respiratory, skin, wound & burn infection, venereal infections, alimentary tract infection, blood born infection and nosocomial infection.	12	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,K6
III	Bacterial diseases and Protozoan diseases Classification of medically important microorganisms; Classification of pathogenic bacteria. Staphylococcus, Streptococcus, Neisseria; Corynebacterium, Clostridium, Vibrio, Yersinia, Haemophilus, Mycobacterium, Spirochetes, Bordetella, Rickettsiae, Chlamydia.	12	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,K6

	Protozoandiseases: Causative agents, Symptoms, mode of transmission, prophylaxis and control: Malaria			
IV	Viral and Fungal diseases General properties of viruses Host interactions: Pox viruses; Herpes virus, Hepatitis viruses Picorna viruses, Ortho myxo viruses and Human Immunodeficiency viruses (HIV) Fungal diseases of man, Epidemiology. Dermatophytes, dimorphic fungi, opportunistic fungal pathogens. Description and classification of pathogenic fungi and their laboratory diagnosis, treatment. Superficial mycoses, subcutaneous mycoses, systemic mycoses.	12	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,
V	Antimicrobial agents Antimicrobial agents: Antibiotics, Antifungal and Antivirals. Antibiotic and chemotherapeutic agents: Sulfur drugs, Antibiotics and their classification, Mode of action, chemical nature of different antibiotics. Antibiotic assay and sensitivity test. Antiviral drugs- Antibiotic/Drug resistance – origin, cause, and clinical implication with special references of multidrug resistant bacteria. Superbugs.	12	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,
VI	Self Study for Enrichment (Not included for End Semester Examinations) knowledge on various types of infection, host parasite relationship and virulence factors associated with the pathogen.	-	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,

Text Books

1. Apurba s. Essentials of Microbiology(3rd Edition).jaypee brothers Medical Publishers, 2020.
2. Warren E. Review of Medical Microbiology and Immunology. (17th edition).McGraw Hill/ Medical,2022.
3. Ananthanarayanan. R. and C.K. Jayaram Panicker. Textbook of Microbiology Orient Longman, 1997.
4. Jawetz Melnick .Medical Microbiology(28th edition). McGraw Hill/ Medical,2019.
5. **Aejaz iqbal .Medical Microbiology(1st edition). Notion Press, 2020.**

Reference Books

- 1.Saumya singh. Medical Microbiology(1st edition), CBS Publishers , 2022.
- 2.Michael. J. Pelczar, JR, E.C.S. Chan, Noel R. Krieg. Microbiology.TATA McGraw Hill. pp: 673-763,2020.
- 3.Arora .Medical mycology (2nd edition). CBS Publishers,2019.
- 4.Reena ray gosh. Medical mycology(1st edition). CBS Publishers, 2019.
- 5.Saravanan P. Virology(1st edition). MJP Publisher,2021.

Web References

1. <https://www.microbe.net/resources/microbiology/web-resources/>
2. <https://www.omicsonline.org/medicalmicrobiology-diagnosis.phpguides.emich/immunology>
3. https://content.kopykitab.com/ebooks/2017/04/10504/sample/sample_10504.pdf

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion.

Course Designer

Ms. R. Kiruthiga

Semester: II	Internal Marks : 25	ExternalMarks:75		
COURSECODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB2DSE2B	PUBLIC HEALTH MICRO BIOLOGY	DISCIPLINE SPECIFIC ELECTIVE COURSE	4	3

Course Objectives

This course deals with the microbes related to public health and to gain knowledge about the medically important human microbial pathogens with focus on the diseases caused by them, disease pathogenesis, lab diagnosis, prophylaxis, control measures.

Prerequisites

Basic knowledge about diagnosis and treatment methods for various microbial infections.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define and examine the basic ideas about microbial association	K1,K4
CO2	Diagnose and analyze various airborne disease	K3,K4
CO3	Determine the water borne diseases and its control	K1,K4
CO4	Evaluate and discuss about the role of microorganisms in food	K3,K5
CO5	Extend the diagnosis hospital acquired Infections	K2,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3	3	3	3	2	3
CO2	2	3	2	3	3	3	2	3	3	3
CO3	3	2	3	3	3	3	2	3	2	3
CO4	3	2	2	2	2	3	2	2	2	3
CO5	3	2	3	3	2	2	3	3	3	3

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-“indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to public health: Definition, scope, concept and importance of public health microbiology – roles of microbiologist in public health – microbial association of water, air and soil. Basic concept on pollution and its types.	12	CO1, CO2, CO3	K1, K3, K4
II	Air borne infections: Air and its composition – indoor air and outdoor air. Air borne diseases- (bacterial, fungal and viral), Sources of infection. Methods of enumeration of microorganisms in air–air sanitation.	12	CO1, CO2, CO3, CO4	K1, K3, K4, K5
III	Water borne infections: Kinds of water – water borne diseases (viral, bacterial, protozoan) – methods of enumeration of microorganisms in water – indicator organisms – water treatment control of water borne diseases.	12	CO1, CO2, CO3, CO4	K1, K3, K4, K5
IV	Food borne diseases: Definition and importance of food hygiene – types (spoilage of meat and its products, milk and dairy products, fish and fish products and eggs) – Role of microorganisms in food spoilage and poisoning – food borne diseases – types of food borne diseases .	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Nosocomial infection: Introduction and its types, pathogenicity of nosocomial infection, prevention and control of nosocomial infections. Prophylactic immunization – disposal of infective hospital and laboratory materials– techniques used	12	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5, K6

	For the diagnosis of hospital acquired infection.			
VI	Self Study for Enrichment (Not included for End Semester Examinations) Classification of Medically important Microbes.	-	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5, K6

Text Books

1. Patrick R. Murray, Ken S. Rosenthal, and Michael A. Pfaller. (2012). Medical Microbiology. Elsevier Health Sciences.
2. Keith Struthers J. (2017). Clinical Microbiology. Taylor & Francis Group.
3. Sastry Apurba S. (2021). Essentials of Microbiology. Jaypee Brothers Medical Publishers
4. Gerard Tortora (Author), Berdell Funke (Author), Christine Case. (2022). Microbiology An Introduction. Pearson Mastering.

Reference Books

1. Joanne Willey, Christopher J. Woolverton, Linda Sherwood (2011). Prescott's Microbiology. McGraw Hill
2. Park K. (2017). Parks Text Book of Preventive and Social Medicine.
3. Goering, Hazel Dockrell, Mark Zuckerman, Peter Chiodini. (2018). Mim's Medical Microbiology and Immunology
4. Engelkirk P.K. and Duben-Engelkirk J. (2015). Burton's Microbiology for the Health Sciences, 10th Edn. Wolters Kluwer Health.

WebReferences

1. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/ln_intro_ph_final.pdf
2. <https://www.webmd.com/lung/what-are-airborne-diseases>
3. <https://www.health.state.mn.us/diseases/waterborne/basics.html>
4. https://www.who.int/health-topics/foodborne-diseases#tab=tab_1
5. <https://www.osmosis.org/answers/nosocomial-infection>

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion, Quiz.

Course Designer

Dr.V.Aruna

Semester: II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS /WEEK	Credits
23PMB2DSE2C	MEDICAL PARASITOLOGY	DISCIPLINE SPECIFIC ELECTIVE	4	3

Course Objectives

To enable the students to understand the clinically important protozoa, helminths and arthropods and acquire knowledge about the areas in which parasitic infections are endemic.

Prerequisites

Basic knowledge and concepts of clinically important parasites

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define and understand diagnostic techniques in parasitology	K1, K2
CO2	Analyze and explain clinical significance of <i>Entamoeba histolytica</i>	K3, K4
CO3	Determine and apply the treatment of <i>Leishmania donovani</i>	K3, K4
CO4	Evaluate and categorize the <i>Plasmodium</i> spp.	K4, K5
CO5	Criticize and manage <i>Taenia solium</i>	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	1	3	2	3	3	2
CO2	2	2	2	2	2	3	2	3	2	2
CO3	2	3	1	2	3	3	2	3	2	2
CO4	3	2	3	2	2	3	2	3	2	1
CO5	3	3	3	3	2	3	2	3	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction and classification of parasites: Scope and historical landmarks in Parasitology. Basic principles and nomenclature aspects of parasites. Classification of Parasites – Protozoa and helminthic infection. Laboratory Diagnostic Techniques in Parasites – Direct Identification and Indirect Identification. Concentration methods - flotation techniques and sedimentation techniques	12	CO1, CO2, CO3	K1, K2, K3, K4
II	Amoebae: Morphology, Clinical Significance, Symptoms, Pathogenicity, Lab Diagnosis, Treatment and Prevention - Amoebae: <i>Entamoeba histolytica</i> , <i>Naegleria fowleri</i> , <i>Acanthamoeba</i>	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
III	Flagellates: Morphology, Clinical Significance, Symptoms, Pathogenicity, Lab Diagnosis, Treatment and Prevention - Flagellates: <i>Giardia lamblia</i> , <i>Trichomonas vaginalis</i> , <i>Trypanosoma</i> , <i>Leishmania</i> .	12	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,
IV	Sporozoans: Morphology, Clinical Significance, Symptoms, Pathogenicity, Lab Diagnosis, Treatment and Prevention - Sporozoans: <i>Plasmodium</i> , <i>Toxoplasma gondii</i> , <i>Cryptosporidium parvum</i> , <i>Cyclospora cayetanensis</i> .	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6,
V	Cestodes and Nematodes: Morphology, Clinical Significance, Symptoms, Pathogenicity, Lab Diagnosis, Treatment and Prevention – <i>Taenia solium</i> , <i>Ancylostoma duodenale</i> and <i>Wuchereria bancrofti</i> .	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Isolation, identification, clinical manifestations of medically important parasites	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Apurba S Sastry, Sandhya Bhat. (2018). Essentials of Medical Parasitology. 2nd Edition. Jaypee Brothers Medical Publishers.
2. Sougata Ghosh. (2021). Paniker's Text book of Medical Parasitology. 9th Edition. Jaypee Brothers Medical Publishers.

3. Nagoba, B.S. (2020). Medical Microbiology and Parasitology: Prep Manual for Undergraduates, 4th Edition. Elsevier India.
4. Baveja, V. and Baveja, C.P. (2019). Medical Parasitology. 4th Edition. Arya Publishing Company.
5. Sumeeta Khurana, Abhishek Mewara. (2021). Textbook of Medical Parasitology. 1st Edition. Universities Press India Pvt. Ltd

Reference Books

1. Nanda Maheshwari. (2022). Clinical Microbiology & Parasitology for DMLT Students. 4th Edition. Jaypee Brothers Medical Publishers.
2. Arora, D.R. (2020). Medical Parasitology. 5th Edition. CBS Publisher.
3. Shyamasundari, K. and Hanumantha Rao. K. (2021). Medical Parasitology. 1st Edition. MJP Publishers.
4. Rajan, S. and Selvi Christy, R. (2018). Essentials of Microbiology. 4th Edition. CBS Publishers and Distributors Pvt. Ltd.
5. Joanne M. Willey, Kathleen M. Sandman and Dorothy H. Wood (2022). Prescott's Microbiology. 12th Edition. McGraw-Hill Education.
6. Apurba S Sastry and Sandhya Bhat. (2022). Essentials of Medical Microbiology. 4th Edition. Jaypee brothers med Pub Pvt Ltd.

Web References

1. <https://byjus.com/biology/parasites-symbiosis/>
2. https://www.brainkart.com/article/Parasite-and-Host_41024/
3. <https://byjus.com/biology/entamoeba-histolytica-life-cycle/>
4. <https://microbenotes.com/giardia-duodenalis/>
5. <https://www.onlinebiologynotes.com/plasmodium-falciparum-morphology-life-cycle-pathogenesis-and-clinical-disease/>
6. [https://www.meduniwien.ac.at/hp/fileadmin/tropenmedizin/Lehre/Helminths and Helminthiasis_Kompatibilitaetsmodus.pdf](https://www.meduniwien.ac.at/hp/fileadmin/tropenmedizin/Lehre/Helminths_and_Helminthiasis_Kompatibilitaetsmodus.pdf)

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment, Brain Storming Activity.

Course Designer

Dr. S. Jenny



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG & RESEARCH DEPARTMENT OF MICROBIOLOGY

M.Sc., MICROBIOLOGY – Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022-2024 and onwards)

SEMESTER IV

Semester	Course	Title	Course Code	Inst. Hrs/ Week	Credits	Exam			Total
						Hrs	Marks		
							Int.	Ext.	
IV	Core Course – VIII (CC)	Bioprocess Technology	22PMB4CC8	6	5	3	25	75	100
	Core Choice Course – III (CCC)	A. Bioinformatics and Biostatistics	22PMB4CCC3A	6	4	3	25	75	100
		B. Computational Biology	22PMB4CCC3B						
		C. Microbial Nanotechnology	22PMB4CCC3C						
	Core Practical – IV (CP)	Bioprocess Technology (P)	22PMB4CC4P	6	5	3	40	60	100
	Generic Elective Course – II (GEC)	Entrepreneurial Microbiology	22PMB4GEC2	3	2	3	25	75	100
	Project	Project Work	22PMB4PW	9	5	-	-	100	100
			Total	30	21				500

Semester IV	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	CREDITS
22PMB4CC8	BIOPROCESS TECHNOLOGY	CORE	6	5

Course Objective

To train the students on bioprocess technology so as to develop them for employment in bioprocess industry. To learn the screening of industrial strains, fermenters, media, fermentation process and downstream process.

Prerequisites

Basic knowledge and concepts of Microbial fermentation and techniques.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	List the Concept and History of Strain development	K1, K2
CO 2	State the Fermentor and Fermentation media	K3, K4
CO 3	Explain the Fermentation Products	K3, K4
CO 4	Describe the Production of Pharmaceutical Products	K4, K5
CO 5	Prepare the Production and Purification Industrial Important Microbial Products.	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	3	2	3	2	2	1
CO2	3	3	2	3	3	2	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	2	2	3	2	2	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Bioreactor / Fermenter - Introduction, Definition. Types - Batch, Fed-Batch, Continuous. Solid substrate fermentation, Fermenters (Stirred tank, bubble columns, airlift. Bioreactors, Static, Submerged and agitated fermentation). Operation of Bioreactors, Physico-chemical standards used in bioreactors, limitations of bioreactors, Growth Kinetics, Thermal death kinetics. Advantages &	18	CO1, CO2, CO3,	K1, K2, K3, K4,
II	Strain- Strain selection, Strain development, Methods, Preservation of strains, maintenance and strain improvement by mutation of gene transfer. Media formulation, Sterilization. Criteria for good Medium, Medium requirements for fermentation processes, Carbon Nitrogen, Minerals, Vitamins & other complex nutrients, Oxygen requirements, Quality control Analysis.	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,
III	Downstream processing – extraction, Separation techniques. concentration, recovery & purification techniques. Chromatography-Ion Exchange, Molecular Sieve, Affinity, HPLC, HPTLC, GC, GC-MS, Distillation, Fluid Extraction & Electrodialysis, Centrifugation, Sonification Techniques.	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,
IV	Enzyme technology –Genetic engineering & Protein engineering of enzymes, Immobilized cells and enzymes (Ca-alginate beads, poly acrylamide), industrial applications of immobilized enzymes. Industrial production of Ethyl alcohol, Acetic Acid (Vinegar), Citric acid, lactic acid, α -amylase, protease penicillin, tetracycline and vitaminB12, Production of herbal drugs. SCP, Beer, Wine and Yoghurt.	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,
V	Biological fuel generation – Biogas, Biodiesel, Bioethanol and hydrogen from Biomass. Biotechnology in specific medical & industrial applications - Retting of jute, microbial process for immunization (Production of monoclonal antibodies), Deterioration of paper, textiles, painted surfaces and their prevention, Biofilms, microbial biopolymers, biosurfactants.	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,
VI	Self Study for Enrichment (Not included for End Semester Examinations) Principles of Fermentation Technology, stages offer mentation processes. Design of various commercial media for Industrial fermentation - Medium optimization methods.	-	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,

1. Kalaiselvan P T and Arul Pandi I (2021), Bioprocess technology, MJP publishers pvt ltd, India.
2. Priti Patel and Khushbu Panchal (2020), Bioprocess technology , Scholars' Press pvt ltd, India.
3. Cruger.W and A.Cruger (2017), A Textbook of Industrial Microbiology (2e), Sinauer Associates, Sunderland,US.
4. Michael L Shuler and FikretKargi (2015), Bioprocess Engineering: Basic Concepts, Prentice-Hall of India Pvt Ltd, India
5. Stanbury P.F., Whitaker A. and Hall S.J (2017), Principles of Fermentation Technology. Elsevier India Pvt Ltd, India.
6. Casida, L.E.J.R (2019). Industrial Microbiology, 2019. Second Edition. New age International (P) Ltd., Publishers. New Delhi, India.

Reference Books

1. Michael L Shuler FikretKarg. (2017). Bioprocess Engineering Basic concepts, 2nd Edition, Prentice Hall International services.
2. Peter F Stanbury, Allan Whitaker, Stephen J Hall. (2016). Principles of Fermentation Technology, 2nd Edition, Elsevier Science Ltd. Netherlands
3. Wulf Crueger and Anneliese Crueger. (2000). Biotechnology-A Textbook of Industrial Microbiology, 2nd Edition, Panima Publishing Corporation New Delhi, India
4. Pauline M. Doran. (2012). Bioprocess Engineering Principles, Elsevier.Netherlands
5. Joe, M.M. P.K.Sivakumar&K.Sukesh (2018). An Introduction to Industrial Microbiology.S. Chand Publishing. India

Web References

- 1.<https://www.youtube.com/watch?v=emUoAVOBGec>
- 2.<https://www.youtube.com/watch?v=eXEpiarmYkY>
- 3.https://www.youtube.com/watch?v=Tdb0N_PMpEI
- 4.<https://www.youtube.com/watch?v=opfPTm3z0rE>
- 5.https://www.youtube.com/watch?v=YT34E_DJH24

Pedagogy

Power point presentations, Group Discussion, Seminar, Quiz , Assignment, Brain Storming Activity

Course Designer

Dr. S. Jeyabharathi

SemesterIV	InternalMarks:40		ExternalMarks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB4CCC3A	BIOINFORMATICS AND BIOSTATISTICS	CORE CHOICE COURSE -III	6	4

Course Objective:

The important objective of this course is to enable the students to understand scope and popular databases of bioinformatics and methods of biostatistics. This syllabus gives a broad account of sequence alignment and approaches to drug discovery using bioinformatic techniques.

Prerequisite

Basic knowledge and concept of bioinformatics and applications of biostatistics

Course Outcome

COs	CO Statement	Knowledge level
CO1	Understand scope and popular databases of bioinformatics	K2, K3
CO2	Explain sequence alignment methods	K4, K5
CO3	Explain drug development using bioinformatics	K5, K6
CO4	Compute the measures of central tendency	K4, K6
CO5	Examine the various large sample testing of hypothesis	K4, K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	2	3	2	3	3	3	3	2	3	3
CO3	3	2	3	3	2	3	3	3	3	2
CO4	3	3	3	3	3	3	3	3	2	3
CO5	3	3	3	2	3	3	2	3	3	3

1-Slight(Low)correlation 2-Moderate(Medium)correlation

3-Substantial(High) correlation “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Important contributions - aims and tasks of bioinformatics - applications of bioinformatics - challenges and opportunities. Computer -types, servers and operating system, internet basics - HTML. Biological databases- primary, composite and secondary - Nucleic acid database, Protein database sequence. Structure databases, bibliographic databases - specialized genomic resources.	16	CO1, CO2, CO3	K1, K2, K3, K4, K5
II	Sequence analysis of biological data -significance and Types of sequence alignment-pair wise alignments (FASTA & BLAST) - Models - Global, Local, End space free alignment and gap penalty. Multiple sequence alignment-methods, Clustal W.	14	CO1, CO2, CO3	K1, K2, K3, K4, K5
III	Bioinformatics in drug development: Discovering a drug - target identification and validation-identifying the lead compound – optimization of lead compound-chemical libraries. Cheminformatics and pharma co informatics. NGS.	13	CO1, CO2, CO3	K1, K2, K3, K4, K5
IV	Measures of central tendency - Mean, Median, Mode, Geometric mean and Harmonic mean - Measures of Dispersion- Range, Mean Deviation, Standard Deviation- Correlation-Regression.	16	CO4, CO5	K1, K2, K3, K4, K5,
V	Hypothesis Testing and Large sample tests - Population and sample-Estimation Theory- Point Estimation - Interval Estimation – Testing of hypothesis-Test of significance of mean for Large samples-Test of significance of difference between two means for Large samples- Test of significance for difference between of two standard deviations for Large samples- Test of significance for single proportion for Large samples- Test of significance of difference between two sample for large samples	16	CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Homology Search, Phylogenetic tree construction (MEGA), Protein structure prediction (Secondary & Tertiary), RNA Structure prediction, function prediction (proteins), Protein-protein interaction.		CO1, CO2, CO3	K1, K2, K3, K4, K5

Text books

1. R. Amjesh and S.S.Vinochandra (2019). Bioinformatics for Beginners, Lamber Academic Publishing
2. C.S.V.Murthy (2016). Bioinformatics, Himalaya Publishing House
3. Gautam B. Singh (2015). Fundamentals of Bioinformatics and Computational Biology, Springer Cham Heidelberg, New York
4. K. Subramanian & A. Santha (2012). Statistics for Management Scitech publications
5. P.N.Arora&P.K. Malhan (2012). Biostatistics Himalaya Publishing House

Reference books

1. K.G. Srinivasa, G.M. Siddeshand S.R. Manisekhar (2020). Statistical Modelling and machine leaning principles for bioinformatics techniques, tools and applications (Algorithms for intelligent systems), Springer publications.
2. NoorAhmad Shaik (2019). Essentials of bioinformatics In silico life sciences, medicine. KindleEdition
3. William T. Loging (2016). Bioinformatics and computational biology in drug discovery and Cambrindge University press
4. R.S.N. Pillai &V.Bagavathi (2016). Statistics Theory and Practice, S.Chand
5. BernardRosner (2006). Fundamentals of Biostatistics, Lengage learning

Weblinks

1. https://en.wikipedia.org/wiki/Sequence_alignment
2. <https://www.technologynetworks.com/drug-discovery/articles/target-identification-validation-in-drug-discovery-312290>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3058157>
4. https://en.wikipedia.org/wiki/Sequence_database
5. https://saylordotorg.github.io/text_introductory-statistics/s12-02-large-sample-tests-for-a-popul.html
6. <https://www.analyticsvidhya.com/blog/2017/03/conditional-probability-bayes-theorem/>

Pedagogy

Powerpointpresentation, Seminar, Assignment and Quiz

Course Designer

Dr.P.Bhuvaneswari

Dr.R. Radha

Semester IV	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB4CCC3B	COMPUTATIONAL BIOLOGY	CORE CHOICE COURSE -III	6	4

Course Objective: The important objective of this course is to enable the students to understand scope and popular sequence of computational biology.

Prerequisites:

Basic knowledge and concept of Computational biology.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive level
CO1	Understand scope and popular sequence of statistics	K1,K2
CO2	Explain multiple sequence alignment methods	K3,K4
CO3	Explain protein 3-D structure alignment	K3,K4
CO4	Compute neural network concepts	K4,K5
CO5	Examine the analysis and prediction of regulatory regions	K5,K6

Mapping of CO with PO and PSO

COs	PO1	PO2	PO3	PO4	PO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	2	3	3	2	2
CO2	2	2	2	2	3	2	2	3	2	2
CO3	3	2	1	2	3	3	2	2	3	1
CO4	2	3	2	3	2	2	3	2	2	2
CO5	2	2	3	2	2	1	2	3	2	3

“1”- Slight (Low) Correlation

“3”- Substantial (High) Correlation

“2”- Moderate (Medium) Correlation

“-” indicate there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Sequence alignment algorithms: pairwise alignment - Local and Global alignment concepts -dynamic programming methodology- Smith-Waterman algorithm — Databases searches for homologous sequences - FASTA and BLAST - Statistics of alignment score – p-value – E-value.	6	CO1, CO2, CO3	K1, K2, K3, K4
II	Multiple sequence alignment – methods of multiple sequence alignment Progressive alignment – Clustal W, T-Coffee – Application of multiple sequence alignment - PRINTS, BLOCKS, PRINTS, PRODOM, PFAM – principles and methods for phylogenetic tree construction – NJ, ML and MP –evolutionary models	6	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
III	Protein 3-D structure - comparison and alignment – structure superposition – RMSD– structure alignment methods – DALI, SSAP, CE – multiple structure alignment.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Protein Secondary structure prediction – Chou-Fasman, Garnier - Osguthorpe-Robson (GOR) methods – Neural network concepts and secondary structure prediction – amphipathic helix prediction – transmembrane structure prediction.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Fragment assembly - Genome sequence assembly - Gene finding methods: content and signal methods – Analysis and prediction of regulatory regions - Probabilistic models: Markov chain – random walk – Gene identification and other applications.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Robbe Wiinschiers, Computational Biology : A practical Introduction to Biodata processing and Analysis with Linux, MySQL, and R. (Second Edition), Springer Publication,2013.
2. Shawn T. O'Neil, A Primer for Computational biology.2017
3. Bernhard Haubold, Thomas Wiehe, Introduction to Computational biology: An Evolutionary Approach. Springer Publication,2008.
4. Scott T.Kelley and Dennis Didulo,AHypertext book Computational biology.2022
5. Alona S.Russe ,Computationalbiology.Nova science Publishers.2009

6. B.Thiagarajan,Pa.Rajalakshmi, Computational biology.(1st Edition),MJP Publishers.2013

Reference Books

1. David W. Mount, Bioinformatics – Sequence and Genome analysis, Cold Spring Harbor Laboratory Press, New York, 2001.
2. Arthur M. Lesk, Introduction to Bioinformatics, Oxford University Press, New Delhi (2003).
3. D. Higgins and W. Taylor (Eds), Bioinformatics- Sequence, structure and databanks, Oxford University Press, New Delhi (2000).
4. R. Durbin, S.R. Eddy, A. Krogh and G. Mitchison, Biological Sequence Analysis, Cambridge Univ. Press, Cambridge, UK (1998).
5. A. Baxevanis and B.F. Ouellette. Bioinformatics: A practical Guide to the Analysis of Genes and Proteins, Wiley- Interscience, Hoboken, NJ (1998).
6. P.E. Bourne and H. Weissig (Eds.) Structural Bioinformatics, John-Wiley and Sons, 2003
7. C. Gibas and P. Jambeck, Developing Bioinformatics Computer Skill, 1st Edition, O'Reilly, 2001O'Reilly, 2001.

Web Reference

1. <https://dspace.mit.edu/bitstream/handle/1721.1/103560/6-047-fall2008/contents/lecture-notes/index.htm>
2. <https://ocw.mit.edu/courses/6-047-computational-biology-fall-2015/67001fcd838c877d>
3. <https://www.brics.dk/DS/00/5/BRICS-DS-00-5.pdf>
4. <https://www.technologynetworks.com/drug-discovery/articles/target-identification-validation-in-drug-discovery-312290>

Pedagogy

Power point presentations, Group Discussion, Seminar, Quiz, Assignment, Brain Storming Activity.

Course Designer

Dr.J.Ambika

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	CREDITS
22PMB4CCC3C	MICROBIAL NANOTECHNOLOGY	CORE CHOICE COURSE -III	6	4

Course objective

The most important objectives that are frequently found in nanobiology involve applying nanotools to relevant medical/ biological problems and refining these applications. Microbes are playing an important role in the synthesis of nanoparticles. This syllabus would enlighten the students to understand basic concepts and application of nanotechnology.

Prerequisite:

Basic knowledge and concept of nanoparticles and its application

Course Outcome:

CO Number	CO Statement	Knowledge level
CO1	Apply the basics of Nanosciences, able to differentiate particles at macro, micro and nano level	K4,K5
CO2	Know how to synthesize nano particles on a laboratory scale	K2,K5
CO3	Critique knowledge about characterization of nanoparticles	K3,K4
CO4	Explain the application of nanoparticles	K3,K5,
CO5	Expand about merits and demerits of nanoparticles	K5K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	3	2	2	3	2	3
CO2	3	3	2	3	3	2	2	3	3	3
CO3	2	3	3	2	3	3	3	2	3	3
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to bio nanotechnology - Milestones in History – bio nanotechnology – concept and future prospects – application in Life Sciences. Terminologies – nanotechnology, bio nanotechnology, nano biomaterials, biocompatibility, nanomedicine, nanowires, quantum Dots, nanocomposite, nanoparticles, nano sensors. Biotechnology to bio nanotechnology, Current status of bio nanotechnology.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
II	Microbial nanotechnology –Microbial synthesis of Nanoparticles. Synthesis of nanodrugs – metal nanoparticles and drug delivery vehicles – Nano shells – T ectodentrimers Nanoparticle drug systems – Diagnostic applications of nanotechnology. Preparation of nano biomaterials – Polymeric scaffolds collagen, Elastins: Mucopolysaccharides, cellulose and derivates; Dextrans; Alginates; Pectins; Chitin.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Types of nanoparticles and methods of characterization - Nanoparticles – types, functions – Silver, Gold and Titanium. Physical and chemical properties of nanoparticles. Characterization of nanoparticles – UV-Vis spectroscopy, particle size analyzer, Electron Microscopy – HRTEM, SEM, AFM, EDS,XRD	18	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5
IV	Applications of bio nanotechnology - Drug and gene delivery – protein mediated and nanoparticle mediated. Uses of nanoparticles in MRI, DNA and Protein Microarrays. Nanomedicines, Antibacterial activities of nanoparticles. Nanotechnology in agriculture. Toxicology in nanoparticles – Dosimetry. Nano therapy for cancer treatment – Interior artery expansions – Replacing joints with better stuff. - Radioactive tubere ne cages in Nuclear medicine.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

V	Merits and demerits of nanoparticles – drug targeting, protein detection, MRI, development of green chemistry – commercial viability of nanoparticles. Cleaning the air with Nanotechnology – Nanotechnology for water treatment. Microbial nanoparticles. Nanocarbon ball as deodorizer in ferment process. Biomotors for engineered devices. Possible harm from Nanomaterials. Nanoscience in India – Nanoscience education abroad – Looking at ethics and society. Disadvantages – pollution and health risks associated with nanoparticles.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Nanobiometrics - Introduction – lipids as nano-bricks and mortar- Self assembled nanolayers - the bits that do things - proteins – DNA Computer	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. T. Pradeep (2017). NANO: The Essentials: Understanding Nanoscience and Nanotechnology, McGraw Hill Education Publisher
2. Risal Singh Shipra MitalGupta (2018). Introduction to Nanotechnology, Oxford University Press.
3. Chattopadhyay K.K.. (2019). Introduction to Nanoscience and Nanotechnology Prentice Hall India Learning Private Limited.

Reference Books

1. M. A. Shah and K. A. Shah. (2019). Nanotechnology, Wiley; Second edition.
2. N. Sriraam.. (2019). Biomedical and Clinical Engineering for Healthcare Advancement, 1edition, Business Science Reference
3. Mahendra Rai, Patrycja Golińska (2020). Microbial Nanotechnology, 1st edition, CRC Press

Web links

1. <https://www.ncbi.nlm.nih.gov/pubmed/17947022>
2. <https://www.springeropen.com/p/nano>
3. <https://www.worldscientific.com/worldscibooks/10.1142/7364>
4. <http://www.imedpub.com/journal-nanoscience-nanotechnology-research/>

Pedagogy

Power point presentations, Group Discussion, Seminar, Quiz, Assignment, Brain Storming activity.

Couse Designer

Dr. P.Bhuvaneswari

SEMESTERIV	INTERNAL MARKS: 40	EXTERNAL MARKS : 60		
COURSECODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDIT
22PMB4CC4P	BIOPROCESS TECHNOLOGY (P)	CORE PRACTICAL	6	5

Course Objective :

- To understand the rules and procedures to be observed in a laboratory
- To familiarize and understand the parts and use of microscopes.
- The technical skills are understood on immobilization and purification techniques of enzymes.

Course Outcome and Cognitive Level Mapping

COS	CO Statement	Knowledge Level
CO1	Illustrate media preparation, sterilization	K2
CO2	Describe about the Ethanol production	K2
CO3	Organized view of industrially important products from microbes	K3
CO4	To isolate the industrially important microorganisms.	K4
CO5	Explain about the isolation of microbes from foods.	K5

Mapping of CO with PO and PSO

COs	PO1	PO2	PO3	PO4	PO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	2	3	3	2	2
CO2	2	2	2	2	3	2	2	3	2	2
CO3	3	2	1	2	3	3	2	2	3	1
CO4	2	3	2	3	2	2	3	2	2	2
CO5	2	2	3	2	2	1	2	3	2	3

“1”- Slight(Low) Correlation

“3”- Substantial(High) Correlation

“2”- Moderate (Medium) Correlation

“-“ indicate there is no correlation

SYLLABUS:

1. Media preparation, Sterilization.
 2. Culture transfer technique, Isolation of Pure culture.
 3. Culture optimization (pH, Temperature, Carbon & Nitrogen sources).
 4. Bacterial Growth Curve.
 5. Production and analysis of Ethanol using *Saccharomyces cerevisiae*
 6. Microbial production of citric acid using *Aspergillus niger*.
 7. Immobilization of cells for enzyme production.
 8. Alcohol production by yeast fermentation and its estimation.
 9. Techniques to determine microbial contamination.
 10. Purification of enzymes by salting and dialysis and column chromatography technique.
- .

REFERENCES:

1. Casida LE. (1991). Industrial Microbiology. 1st edition. Wiley Eastern Limited.
2. Crueger W and Crueger A. (2000). Biotechnology: A textbook of Industrial Microbiology. 2nd edition. Panima Publishing Co. New Delhi.
3. Patel AH. (1996). Industrial Microbiology. 1st edition, Macmillan India Limited.
4. Stanbury PF, Whitaker A and Hall SJ. (2006). Principles of Fermentation Technology. 2nd edition, Elsevier Science Ltd.
5. John P. Harley Microbiology Lab Manual (2007) 7th edition McGraw Hill Medical Publication division.
6. Donal M. Weir, John Steward (1993) Immunology – VII edition. ELBS, London.
7. Richard M. Hyde (1995). Immunology III edition. National Medical series, Williams and Wilkins, Harward Publishing company.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr.J.Ambika

SEMESTERIV	INTERNAL MARKS : 25		EXTERNAL MARKS : 75	
COURSECODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT
22PMB4GEC2	ENTREPRENEURIAL MICROBIOLOGY	Generic Elective Course - (GEC)	3	2

Course Objective:

This course is designed to provide comprehensive knowledge to the students regarding Entrepreneurial Microbiology.

Prerequisites

To Comprehend and analyze entrepreneurial microbiology.

Course Outcome:

COs	CO Statement	Knowledge level
CO1	Define the basics of entrepreneur development	K1
CO2	Recite the knowledge about fermentation products	K1
CO3	Critique knowledge about mushroom cultivation	K4
CO4	Generalize the basic idea of patents	K6
CO5	Expand the role of brewing	K6

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	S	S	S	S	M
CO3	S	S	M	L	M
CO4	S	S	S	S	M
CO5	S	M	M	M	M

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to Entrepreneur- Entrepreneur development, activity, Institutes involved, Government contributions to entrepreneurs, risk assessment. Industrial Microbiology, Definition, scope and historical development.	12	CO1, CO2, CO4, CO5	K1, K2, K3, K4, K5
II	Microbial cells as fermentation products- Bakers yeast, food and feed yeasts, Bacterial Insecticides, Legume Inoculants, Mushrooms, Algae. Enzymes as fermentation products. Bacterial and Fungal Amylases, Pectinases, Invertases, and other enzymes.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Mushroom cultivation and Composting- Cultivation of <i>Agaricus campestris</i> , <i>Agaricus bisporus</i> , and <i>Volvariella volvaciae</i> ; Preparation of compost, filling tray beds, spawning, maintaining optimal temperature, casing, watering, harvesting, storage. Biofertilizers- Historical background, Chemical fertilizers versus biofertilizers. <i>Rhizobium sp</i> , <i>Azospirillum sp</i> , <i>Azotobacter sp</i> , as Biofertilizers.	12	CO1, CO2, CO3, CO4	K2, K3, K4, K5
IV	Patents and secret processes- History of patenting, composition, subject matter and characteristics of a patent, Inventor, Infringement, cost of patent. Patents in India and other countries.	12	CO1, CO2, CO3, CO4	K2, K4, K5, K6
V	Brewing- Media components, preparation of medium, Microorganisms involved, maturation, carbonation, packaging, keeping quality, contamination, by products.	12	CO1, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not included for End Semester Examinations) Proteolytic Enzymes, Fermentation Economics, Production of Industrial alcohol, organic farming.	-	CO1, CO2, CO3, CO4	K2, K3, K4, K5

Text Books

1. A. C. Shukla (2023). Entrepreneurship with Microorganisms (Developments in Applied Microbiology and Biotechnology), Academic Press Inc.
2. Natarajan Amaresan, Dhanasekaran Dharumadurai, Olubukola Oluranti Babalola (2023). Food Microbiology Based Entrepreneurship: Making Money from Microbes, Springer Verlag, Singapore.
3. Dr. Rohit Shankar Mane, Rachana Nagarkar, Arnav Padhi (2022). Entrepreneurship in Microbiology, Scientist R Academy.
4. Natarajan Amaresan, Dhanasekaran Dharumadurai, Diana R. Cundell (2022). Industrial Microbiology Based Entrepreneurship: Making Money from Microbes, Springer.
5. Natarajan Amaresan, Dhanasekaran Dharumadurai, Olubukola Oluranti Babalola (2022). Agricultural Microbiology Based Entrepreneurship: Making Money from Microbes, Springer Verlag, Singapore.

Reference Books:

1. Apurba S Sastry, Sandhya Bhat (2023). Essentials of Medical Microbiology, Jaypee Brothers Medical Publishers.
2. C.P Baveja (2022). Textbook of Microbiology, Arya Publishing.
3. Dorothy Wood, Joanne Willey, Kathleen Sandman (2022). Prescott's Microbiology, 12th Edition, McGraw-Hill Education.
4. V Baveja C P Baveja (2022). Text and Practical Microbiology for MLT 3rd Edition, Arya Publishing Company.
5. Apurba S Sastry, Sandhya Bhat (2021). Essentials of Practical Microbiology, Jaypee Brothers Medical Publishers.

Weblinks:

1. [https://en.wikipedia.org/wiki/Bioinformatics#:~:text=Bioinformatics%20\(%2F%CB%8Cba%C9%AA,sets%20are%20large%20and%20complex](https://en.wikipedia.org/wiki/Bioinformatics#:~:text=Bioinformatics%20(%2F%CB%8Cba%C9%AA,sets%20are%20large%20and%20complex).
2. <https://www.genome.gov/genetics-glossary/Bioinformatics>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1122955/>
4. <https://academic.oup.com/bioinformatics>
5. <https://www.britannica.com/science/bioinformatics>

Pedagogy

Powerpoint presentations, Group discussion, Seminar, Quiz, Assignment, Brainstorming activity.

Course Designer

Dr.P.F.Steffi

ANNEXURE N

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED (III CYCLE) WITH “A” GRADE BY NAACISO
9001:2015 CERTIFIED
TIRUCHIRAPPALLI – 620 018

DEPARTMENT OF BIOTECHNOLOGY



B.Sc., BIOTECHNOLOGYSYLLABUS
2023 – 2024 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF BIOTECHNOLOGY

VISION

- To educate a broad range of basic lab skills applicable to biology and biotechnology.
- Make the students know and understand broad range of basic biological concepts and can apply and analyse these in at least one specialty area.
- Make the students generate a hypothesis, design approaches to test them and interpret the data from those tests to reach valid conclusions.
- To develop the ability to place their own works in a broader scientific context.

MISSION

- To produce ambitious, creative graduates who are interested in continuing their education in biosciences.
- Make the students to read and critically evaluate the original scientific literature.
- To produce responsible biotechnology professionals to fulfill the employment and research needs in the biotechnology industry.
- Enhance the student's ability to integrate their acquired computer and biosciences knowledge and skills to investigate and solve the biological problems.
- To create opportunities for placement in leading industries through Internships.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO 1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO 2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash students hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO 3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO 4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO 5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc., BIOTECHNOLOGY PROGRAMMES

PO NO	On completion of B.Sc., Biotechnology Programme, the students will be able to
PO 1	Academic Excellence and Competence: Elicit firm fundamental knowledge in theory as well as practical for coherent understanding of academic field to pursue multi and interdisciplinary science careers in the future.
PO 2	Holistic and Social approach: Create novel ideas related to the scientific research concepts through advanced technology and sensitivity towards sustainable environmental practices as well as social issues.
PO 3	Professional ethics and Teamwork: Explore professional responsibility through projects, internships, field trips/industrial visits and mentorship programmes to transmit communication skills.
PO 4	Critical and Scientific thinking: Equip training skills in Internships, Research Projects to do higher studies in multidisciplinary paths with a higher level of specialization to become professionals of high - quality standards.
PO 5	Social Responsibility with ethical values: Ensure ethical, social and holistic values in the minds of learners and attain gender parity for building a healthy nation.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc., BIOTECHNOLOGY

PSO NO	The students of B.Sc., Biotechnology will be able to	POs Addressed
PSO 1	Acquire knowledge of biological sciences with the implementation of technology on different living systems like plants, animals and microbes.	PO1 PO 2
PSO 2	Explain the fundamental concepts and develop skills in Immunology, Developmental biology, Nanobiotechnology, Genomics, Proteomics, Bioinformatics, Agriculture and Medicine	PO 1 PO 2
PSO 3	Apply the technical aspects related to the improvement of microbes, plants and live-stocks for the welfare of human and environment.	PO 2 PO 4
PSO 4	Impart hands-on techniques in various thrust areas of biotechnology to meet the emerging demands in industry, academia and research.	PO 2 PO 4
PSO 5	Gaining knowledge to transform theoretical concepts to practical products/process to move ahead in entrepreneurship and apply the laws concerning to IPR and bioethics	PO 2 PO 3 PO 5



Cauvery College for Women (Autonomous), Trichy -18

Department of Biotechnology

B.Sc., Biotechnology

Learning Outcome Based Curriculum Framework (CBCS - LOCF)

(For the Candidates admitted from the Academic year 2023-2024 and onwards)

Semeste	Part	Cou rse	Course Title	Course Code	Inst. Hrs.	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC)	Podhu Tamil – I	23ULT1	6	3	3	25	75	100
			Hindi ka Samanya Gyan aur Nibandh	23ULH1						
			Poetry, Grammar and History of Sanskrit Literature	23ULS1						
			Foundation Course: Paper I - French I	23ULF1						
	II	English Language Course - I (ELC)	General English -I	23UE1	6	3	3	25	75	100
	III	Core Course – I (CC)	Cell and Molecular Biology	23UBT1CC1	5	5	3	25	75	100
		Core Practical - I (CP)	Cell and Molecular Biology (P)	23UBT1CC1P	3	3	3	40	60	100
		First Allied Course- I (AC)	Biological Chemistry	23UBT1AC1	4	3	3	25	75	100
		First Allied Course- II (AP)	Biological Chemistry (P)	23UBT1AC1P	4	3	3	40	60	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	Value Education	23UGVE	2	2	-	100	-	100
	Total				30	22				700
II	I	Language Course - II (LC)	Podhu Tamil -II	23ULT2	6	3	3	25	75	100
			Hindi Literature &Grammar – II	22ULH2						
			Prose, Grammar and History of Sanskrit literature	23ULS2						
			Basic French – II	22ULF2						
	II	English Language Course -II (ELC)	General English -II	23UE2	6	3	3	25	75	100
		Core Course – II (CC)	Genetics	23UBT2CC2	5	5	3	25	75	100
		Core Practical - II (CP)	Genetics (P)	23UBT2CC2P	3	3	3	40	60	100
		Core Course - III (CC)	Biomolecular	23UBT2CC3	2	2	3	25	75	100

III		Techniques							
	First Allied Course – III (AP)	General Microbiology	23UBT2AC3	4	3	3	40	60	100
	Ability Enhancement Compulsory Course-II(AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
	Ability Enhancement Compulsory Course-III(AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
	Extra Credit Course	SWAYAM	As per UGC Recommendation						
Total				30	22				800

Semester II	Internal Marks : 25			External Marks : 75	
Course code	Course Title	Category	Hours/Week	Credits	
23UBT2CC2	GENETICS	CORE COURSE-II	5	5	

Course Objectives

- To predict and analyze the inheritance of traits in various genetic scenarios.
- To apply the concepts of genetics, inheritance patterns and genetic disorders in various organisms including humans.
- To conduct pedigree analysis to determine the inheritance patterns of genetic traits within families.
- To apply the knowledge of chromosomal disorders and chromosomal aberrations into genetic research, genetic counselling and the diagnosis of chromosomal disorders.
- To identify scenarios and conditions where genetic drift and genetic shift are most likely to occur.

Course outcome and Cognitive Level Mapping

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand the historical milestones in molecular biology and genetics, the structure and functions of nucleic acids and their significance in the field of biology and genetics.	K1, K2
CO2	Illustrate about the structural organization of chromosome, chromosomal aberrations, chromosomal disorders.	K2
CO3	Understand the fundamental principles of inheritance as elucidated by Mendel, as well as subsequent developments in genetics related to gene linkage and independent assortment.	K3
CO4	Analyse pedigrees to determine the inheritance patterns of sex-linked traits and predict the probabilities of inheritance.	K4
CO5	Apply the knowledge of gene frequency, genetic drift and shift, pedigree analysis into study of evolution, genetic disorders.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	1	3	1	2	3	1
CO2	3	2	2	2	1	3	1	2	2	1
CO3	3	3	2	2	1	3	3	2	2	1
CO4	3	3	2	2	1	3	3	2	3	1
CO5	3	3	3	3	1	3	3	3	3	2

“1” – Slight (Low) correlation

“3” – Substantial (High) correlation

“2” - Moderate (Medium) correlation

“_” indicates there is no correlation

CORE COURSE-II GENETICS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Historical developments of molecular biology and Genetics; DNA as genetic material - Griffith's, Hershey - chase Experiments; Avery Macleod McCarty Experiment. Structure and functions of Nucleic acids: Nucleosides and Nucleotides, Purines and Pyrimidines. Watson and Crick model of DNA. A, B & Z forms of DNA. Structure of RNA and its Types.	15	CO1, CO2, CO3	KI, K2, K3, K4
II	Chromosome's structural organization – Chromatin and chromatids; Special types of Chromosomes: Polytene and Lampbrush chromosomes. Chromosomal variation in number, Changes in Chromosomal structure, Chromosomal disorders - Transposable elements in prokaryotes and eukaryotes.	15	CO1, CO2, CO4	KI, K2, K3, K4
III	Early concepts of inheritance; Discussion on Mendel's Laws of inheritance - Law of Dominance and Uniformity – Incomplete dominance and codominance; Law of Segregation of genes - Morgan's work on Drosophila; Law of Independent Assortment – Dihybrid cross. Test cross and Back Cross	15	CO2, CO3, CO4	KI, K2, K3, K4
IV	Sex determination, differentiation and sex-linkage, Sex – linked inheritance, Sex-influenced and sex-limited traits; Linkage Analysis – Fruit Fly. Recombination and genetic mapping in eukaryotes, Multiple Alleles – ABO Blood Grouping.	16	CO3, CO4, CO5	KI, K2, K3, K4
V	Genetic control of Development in Drosophila and Arabidopsis. Population genetics, calculating gene frequency, factors affecting gene frequency. Genetic drift, Shift, Pedigree analysis and genetic counselling.	14	CO3, CO4, CO5	KI, K2, K3, K4
VI	Self-Study for Enrichment RNA as genetic material – Fraenkel - Conrat Experiment- Chromosomal aberrations, Somatic cell genetics. (Not Included for End Semester Examination)	-		KI, K2, K3, K4

Text Books

1. Vishnu Shankar, S. (2021). Fundamentals of Genetics and Molecular Biology. Red'shine Publication Pvt. Ltd.
2. Pierce, B. A. (2018). *Genetics essentials: concepts and connections* (p. 488). WH Freeman.
3. Brown, T. A. (2012). *Introduction to genetics: a molecular approach*. Garland Science.
4. Vega, L. (2019). *Fundamentals of genetics*. Scientific e-Resources.
5. Panchal, S. (2022). Fundamentals of Genetics. In *Genetics Fundamentals Notes* (pp. 3-51). Singapore: Springer Nature Singapore.

Reference Books

1. Pierce, B. A. (2012). *Genetics: a conceptual approach*. Macmillan.
2. Brooker, R. J. (2015). *Genetics: analysis and principles*. (No Title).
3. Goldberg, M. L., Fischer, J. A., Hood, L., & Hartwell, L. (2021). *Genetics: from genes to genomes*. (No Title).
4. Russell, P. J., & Gordey, K. (2002). *IGenetics* (No. QH430 R87). San Francisco: Benjamin Cummings.
5. Watson, J. D. (2004). *Molecular biology of the gene*. Pearson Education India.

E - books

1. <https://www.pdfdrive.com/lewins-genes-xii-e185848559.html>
2. <https://www.pdfdrive.com/introduction-to-genetics-a-molecular-approach-e187102063.html>
3. <https://www.pdfdrive.com/the-cell-a-molecular-approach-e186369576.html>
4. <https://www.pdfdrive.com/genetics-a-conceptual-approach-e186741220.html>

Web References

1. <https://microbenotes.com/category/molecular-biology/>
2. <https://www.easybiologyclass.com/topic-genetics/>
3. <https://ocw.mit.edu/courses/7-03-genetics-fall-2004/pages/lecture-notes/>
4. <http://ndl.iitkgp.ac.in/document/bnZnR2hPaUVqRU9TbFc2Rmp1MVJzN0dyTCs3OGxyRzdaUWpPTzdRV2pBTT0>

Pedagogy

Blackboard, PPT, Videos, Animations, Group Discussion and Quiz.

Course Designer

Dr. R. RAMESHWARI

Semester–II	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
23UBT2CC2P	GENETICS (P)	CORE PRACTICAL-II	3	3

Course Objectives

- To learn and execute various techniques in genome analysis.
- To study the basic concepts of mendelian laws and its deviations using simple problems.
- To study effects of mutations and molecular markers.
- To learn Cultural handling technique of *Drosophila melanogaster*.
- To prepare permanent slides of polytene chromosome.

Course outcome and Cognitive Level Mapping

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Demonstrate the basic principles of important techniques in Genetics.	K1
CO 2	Analyze the Polytene chromosome of the organisms. Identify Barr bodies from Buccal smear	K2
CO 3	Perform basic genetics problem based on Mendel's laws	K2
CO 4	Apply the effects of mutation and appraise the applications of molecular markers.	K3
CO 5	Identify and analyze chromosomal aberrations using karyotyping methods	K3

Mapping with Programme Outcomes

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1	3	3	2	3	1
CO2	3	3	3	2	1	3	2	2	3	1
CO3	3	3	2	2	1	3	2	2	2	2
CO4	3	3	3	3	1	3	2	2	3	1
CO5	3	3	2	3	1	3	2	2	2	1

“1” – Slight (Low) Correlation,
“3”–Substantial (High) Correlation,

“2” – Moderate (Medium) Correlation,
“-” indicates there is no Correlation.

CORE PRACTICAL-II GENETICS (P)

1. Mendel's law of genetics - Mono and Dihybrid crosses.
2. Rearing morphology of *Drosophila* (mutant eye identification)
3. Observation of Genetic model organisms (*Arabidopsis thaliana* and *Coenorhabditis elegans*)- Permanent slides
4. Isolation of spontaneous mutant cells.
5. Isolation of petite mutant yeast cell.
6. Study the effect of physical mutagens on bacterial characteristics.
7. Karyotype analysis- Human (Normal and Abnormal) and onion.
8. Identification of Barr body (Buccal epithelium smear)
9. Preparation of polytene chromosomes (*Chironomus* larvae salivary gland)- squash preparation.
10. Pedigree charts of some common characters like blood group and color blindness.
11. Determination the ABO blood groups in a random sample and calculation of the allele frequency using Hardy Weinberg's law.

Reference books

1. Kaushik Kumar Panigrahi. (2019), *Practical Manual on "Fundamentals of Genetics" (PBG-121)*. First Publisher: Odisha University of Agriculture & Technology.
2. Amita J, Jyotsna A and Vimala V (2018). *Microbiology Practical Manual*. (1st Edition). Elsevier India.
3. Talib VH (2019). *Handbook Medical Laboratory Technology*. (2nd Edition). CBS.
4. Snustad, D.P., Simmons, M.J. (2009). *Principles of Genetics*. V Edition. John Wiley and Sons Inc.
5. Klug, W.S., Cummings, M.R., Spencer, C.A. (2009). *Concepts of Genetics*. IX Edition. Benjamin Cummings.

E-Books:

1. <https://www.pdfdrive.com/a-manual-of-laboratory-and-diagnostic-tests-e157742334.html>
2. <https://www.pdfdrive.com/lippincott-manual-of-nursing-practice-e189815788.html>
3. <https://www.pdfdrive.com/introduction-to-genetic-analysis-solutions-megamanual-e158762003.html>

Web links:

1. <https://egyankosh.ac.in/bitstream/123456789/16314/1/Experiment-8.pdf>
2. [https://uou.ac.in/sites/default/files/slm/MSCBOT-510\(L\).pdf](https://uou.ac.in/sites/default/files/slm/MSCBOT-510(L).pdf)
3. <https://vlab.amrita.edu/?sub=3&brch=76&sim=1089&cnt=1>
4. https://webstor.srmist.edu.in/web_assets/srm_mainsite/files/files/BT0213%20-%20CELL%20BIOLOGY%20PRACTICAL%20MANUAL.pdf
5. https://www.iitg.ac.in/cseweb/vlab/anthropology/procedure_mendels.html

Pedagogy

Practical Observation and Demo

Course Designers

Dr. M. KEERTHIGA

Semester – II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
23UBT2CC3	BIOMOLECULAR TECHNIQUES	CORE COURSE	2	2

Course Objectives

- To understand the working principles of different instruments used in the biological field
- To provide a better understanding of various analytical techniques
- To operate and maintain common bio instruments effectively and safely.
- To understanding of biomedical instrumentation principles in aspects of device design and applications.
- An ability to analyze contemporary bioinstrumentation studies to make connections and decisions based on their scientific merit.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Define and Express the principle of Microscopy, Electrophoresis, Chromatography, Colorimeter and tracing Techniques	K1, K2
CO2	Demonstrate and analyze of the economic and environmental aspects of bioinstrumentation, including cost-effective instrument selection, maintenance, and sustainable practices	K2, K4
CO3	Interpret the types and applications of microscopy, Electrophoresis, Chromatography, Colorimeter and Centrifugation techniques	K3
CO4	Appraise the advantages of advanced techniques like HR_TEM, 2D-GEL, LC-MS, FTIR and NMR	K5
CO5	Elaborate the role of Bioinstrumentation techniques in advancing healthcare, scientific discovery, and the understanding of biological systems	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	1	3	1	2	3	1
CO2	3	2	2	2	1	3	1	2	2	1
CO3	3	3	2	2	1	3	3	2	2	1
CO4	3	3	2	2	1	3	3	2	3	1
CO5	3	3	3	3	1	3	3	3	3	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,
“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

**CORE COURSE
BIOMOLECULAR TECHNIQUES**

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Microscopy: Light Microscopy, Bright and Dark field Microscopy, Fluorescence Microscopy, Confocal Microscope, Electron microscopy	5	CO1, CO2, CO3	K1, K2, K3, K4
II	pH Meter & Spectrophotometer: pH Meter: Principle and Operation of pH meter, Calomel Electrode, Glass Electrode, Combined Electrode, Methods of determining pH. Colorimeter – Principle and its applications, Beer Lambert's Law, Spectrophotometer- Principle and its applications, Types of Spectrophotometer-UV – Visible	4	CO1, CO2, CO3	K1, K2, K3, K4
III	Centrifugation and Imaging Techniques: Centrifugation – Principle, Types – Zonal, Differential, Density gradient centrifugation and ultracentrifugation its applications. Imaging Techniques- X-ray and NMR. Tracer Techniques - Radioactive isotope – Half life, GM Counter, Liquid Scintillation Counter.	5	CO2, CO3, CO4	K1, K2, K3, K4
IV	Electrophoresis: Principle and Applications of Electrophoresis – Types of electrophoresis- Pulsed Field Gel Electrophoresis, SDS-PAGE and 2 D gel; Immunoelectrophoresis; Blotting Techniques; Gel documentation	8	CO3, CO4, CO5	K1, K2, K3, K4
V	Chromatography: Fundamentals of Chromatography - Principle and its applications, Types –TLC, Column, Affinity, Ion –exchange, HPLC.	8	CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment Introduction to Instrumentation, AGE (Not Included for End Semester Examination)	-	CO1, CO2	K1, K2, K3, K4

Text Books

1. Agarwal, P.K., Baqri, S.R & Gau, K. (2022). Molecular Biology, Bioinstrumentation and Biotechniques. Pragati Prakashan Publishers.
2. Vitha, M. F. (2018). *Spectroscopy: Principles and instrumentation*. John Wiley & Sons.
3. Ohlendieck, K., & Harding, S. E. (2018). Centrifugation and ultracentrifugation. *Wilson and Walker's Principles and Techniques of Biochemistry and Molecular Biology*, 1(2), 424-453.
4. Skoog, D. A., Holler, F. J., & Crouch, S. R. (2017). *Principles of instrumental analysis*. Cengage learning.

5. Ismail, B., & Nielsen, S. S. (2010). Basic principles of chromatography. *Food analysis*, 27, 473-498.
6. Enderle, J., & Bronzino, J. (Eds.). (2012). *Introduction to biomedical engineering*. Academic press.

Reference Books

1. Bogusław, B & Irena B(2022). Handbook of Bioanalytics. Springer International Publishing.
2. Webster, J. G. (Ed.). (2003). *Bioinstrumentation*. John Wiley & Sons.
3. Khandpur, R. S. (2005). *Biomedical instrumentation: Technology and applications* (Vol. 1). New York: McGraw-hill.
4. Upadhyay, A., Upadhyay, K., & Nath, N. (1993). Biophysical chemistry principles and techniques.
5. Chatterjee, S., & Miller, A. (2012). *Biomedical instrumentation systems*. Cengage Learning.

E books

1. https://www.academia.edu/30824186/6846793_Bioinstrumentation_pdf
2. <https://files.eric.ed.gov/fulltext/ED407284.pdf>
3. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SMB2103.pdf
4. <https://www.pdfdrive.com/bioanalytical-chemistry-e185517690.html>
5. <https://www.pdfdrive.com/bioanalytical-chemistry-e180345635.html>

Web links

1. <https://nptel.ac.in/courses/102103044>
2. <https://kamarajcollege.ac.in/wp-content/uploads/Allied-I-Bioinstrumentation.pdf>
3. <https://www.youtube.com/watch?v=MvkFWmzFqNM>
4. <https://www.nature.com/scitable/definition/gel-electrophoresis-286/>
5. <https://www.khanacademy.org/science/class-11-chemistry-india/xfbb6cb8fc2bd00c8:in-inorganic-chemistry-some-basic-principles-and-techniques/xfbb6cb8fc2bd00c8:in-in-methodsof-purification-of-organic-compounds/a/principles-of-chromatography>

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment, Animations.

Course Designers

Ms. R. NEVETHA

Semester – II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
23UBT2AC3	GENERAL MICROBIOLOGY	FIRST ALLIED COURSE-III	4	3

Course Objectives

- To study about the classification of microorganisms.
- To study about the media composition and their types
- To study about the structure and characteristics of bacteria, algae, fungi, protozoa and virus.
- To study the characteristics, properties and biological significance of the different organism.
- To obtain the knowledge in health care for prevention of diseases, diagnosis, sterilization methods and drug production.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recall the history of Microbiology and list out the scopes.	K1
CO2	Outline the methods involved in media preparation and sterilization.	K2
CO3	Summarize the structural organization of Bacteria.	K2
CO4	Explain the general characteristic features of Algae and Fungi.	K2
CO5	Describe the Diversity, Ecology and Characteristics of different Protozoa and Viruses.	K3

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	1	3	1	2	3	1
CO2	3	2	2	2	1	3	1	2	2	1
CO3	3	3	2	2	1	3	3	2	2	1
CO4	3	3	2	2	1	3	3	2	3	1
CO5	3	3	3	3	1	3	3	3	3	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,
“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

**FIRST ALLIED COURSE-III
GENERAL MICROBIOLOGY**

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	History and Classification: Historical development of Microbiology - Theories of Spontaneous generation – Biogenesis The scope of Microbiology; General principles and nomenclature – Haeckel's three kingdom concept, Whittaker's five kingdom concept- Carl Woese's three domain classification. Cavalier – Smith's Eight kingdom classification.	8	CO1, CO2, CO3	K1, K2, K3, K4
II	Media Preparation and Sterilization: Media Composition and their types based on physical state & ingredients. Microbial Growth- Factors influencing the growth of Microorganisms – Growth Curve.	8	CO1, CO2, CO3	K1, K2, K3, K4
III	Bacteria: Structural organization of bacteria – Size, shape and arrangement of bacterial cells – Ultrastructure of a bacterial cell – cell wall, cell membrane, ribosomes, nucleoid, slime, capsule, flagella, fimbriae, spores, cysts, plasmid, mesosomes and cytoplasmic inclusions.	9	CO1, CO2, CO3	K1, K2, K3, K4
IV	Diversity of Microbial world: General characteristics of Algae (<i>Chlamydomonas</i> sp) including occurrence, thallus organization, Ultra structure, pigments, flagella, eyespot, food reserves. Reproduction – Sexual and Asexual reproduction. Fungi (<i>Aspergillus</i> sp) – General characteristics of fungi including habitat, distribution, nutritional requirements, Ultrastructure, thallus organization and aggregation.	11	CO1, CO2, CO3,	K1, K2, K3, K4
V	Protozoa & Viruses: Protozoa: General characteristics with special reference to <i>Amoeba</i> , <i>Paramecium</i> and <i>Giardia</i> . Viruses: Viruses, viroids and prions - A general introduction with special reference to the structure of the following: TMV, poliovirus. Lytic and lysogenic cycle.	10	CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment Types of Sterilization and Disinfection. (Not Included for End Semester Examination)	-	CO1, CO2	K1, K2, K3, K4

Text Books

1. Tortora, G. J., Case, C. L., Bair III, W. B., Weber, D., & Funke, B. R. (2008). Microbiology: an introduction. (11th Edition).
2. Baveja, D. C. (2005). Textbook of Microbiology, (2017). Published by Arya Publication, Page, (592).
3. Rathoure, A. K. (2017). Brillion Publishing, Essentials of Microbiology.
4. Tortora, G. J., Funke, B. R., & Case, C. L. (2015). Microbiology: An Introduction, Books a la Carte Edition. Benjamin-Cummings.
5. Madigan, M. T., Martinko, J. M., & Parker, J. (1997). Brock biology of microorganisms (Vol. 11). Upper Saddle River, NJ: Prentice hall.

Reference Books

1. Madigan, M. T., Bender, K. S., Buckley, D. H., Sattley, W. M., & Stahl, D. A. (2018). Brock Biology of Microorganisms. 15th Global Edition. Boston, US: Benjamin Cummins, 1, 1391-1407.
2. Prescott, Harley and Klein (2016). McGraw Hill. Microbiology. 10th Edition.
3. Pelczar, Chan and Kreig (2016). McGraw-Hill. Microbiology 9th Edition.
4. Madigan, M. T., Martinko, J. M., Bender, K. S., Buckley, D. H., & Stahl, D. A. (2016). Microbiologia de Brock-14^a Edição. Artmed Editora.
5. Cowan, M. K., & Talaro, K. P. (2009). Microbiology: a systems approach. McGraw-Hill Higher Education.

E books

1. https://rlmc.edu.pk/themes/images/gallery/library/books/Microbiology/Text_Book_of_Microbiology.pdf
2. https://www.academia.edu/40368024/Textbook_of_MICROBIOLOGY
3. http://www.grsmu.by/files/file/university/cafedry/microbiologii-virysologii-immynologii/files/essential_microbiology.pdf
4. <https://worldofmedicalsavours.com/microbiology-books-pdf/>

Web links

1. <https://archive.nptel.ac.in/courses/102/103/102103015/>
2. <https://www.youtube.com/watch?v=Bhe6Tj2Ebys>
3. <https://microbiologynotes.com/category/basic-microbiology/>
4. <https://byjus.com/biology/microbiology/>

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment, Animations.

Course Designers

DR R. RAMESHWARI

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED (III CYCLE) WITH “A” GRADE BY NAACISO
9001:2015 CERTIFIED
TIRUCHIRAPPALLI – 620 018

DEPARTMENT OF BIOTECHNOLOGY



B.Sc., BIOTECHNOLOGYSYLLABUS
2022 – 2023 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF BIOTECHNOLOGY

VISION

- To educate a broad range of basic lab skills applicable to biology and biotechnology.
- Make the students know and understand broad range of basic biological concepts and can apply and analyse these in at least one specialty area.
- Make the students generate a hypothesis, design approaches to test them and interpret the data from those tests to reach valid conclusions.
- To develop the ability to place their own works in a broader scientific context.

MISSION

- To produce ambitious, creative graduates who are interested in continuing their education in biosciences.
- Make the students to read and critically evaluate the original scientific literature.
- To produce responsible biotechnology professionals to fulfill the employment and research needs in the biotechnology industry.
- Enhance the student's ability to integrate their acquired computer and biosciences knowledge and skills to investigate and solve the biological problems.
- To create opportunities for placement in leading industries through Internships.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO 1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO 2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash students hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO 3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO 4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO 5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc., BIOTECHNOLOGY PROGRAMMES

PO NO	On completion of B.Sc., Biotechnology Programme, the students will be able to
PO 1	Academic Excellence and Competence: Elicit firm fundamental knowledge in theory as well as practical for coherent understanding of academic field to pursue multi and interdisciplinary science careers in the future.
PO 2	Holistic and Social approach: Create novel ideas related to the scientific research concepts through advanced technology and sensitivity towards sustainable environmental practices as well as social issues.
PO 3	Professional ethics and Teamwork: Explore professional responsibility through projects, internships, field trips/industrial visits and mentorship programmes to transmit communication skills.
PO 4	Critical and Scientific thinking: Equip training skills in Internships, Research Projects to do higher studies in multidisciplinary paths with a higher level of specialization to become professionals of high - quality standards.
PO 5	Social Responsibility with ethical values: Ensure ethical, social and holistic values in the minds of learners and attain gender parity for building a healthy nation.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc., BIOTECHNOLOGY

PSO NO	The students of B.Sc., Biotechnology will be able to	POs Addressed
PSO 1	Acquire knowledge of biological sciences with the implementation of technology on different living systems like plants, animals and microbes.	PO1 PO 2
PSO 2	Explain the fundamental concepts and develop skills in Immunology, Developmental biology, Nanobiotechnology, Genomics, Proteomics, Bioinformatics, Agriculture and Medicine	PO 1 PO 2
PSO 3	Apply the technical aspects related to the improvement of microbes, plants and live-stocks for the welfare of human and environment.	PO 2 PO 4
PSO 4	Impart hands-on techniques in various thrust areas of biotechnology to meet the emerging demands in industry, academia and research.	PO 2 PO 4
PSO 5	Gaining knowledge to transform theoretical concepts to practical products/process to move ahead in entrepreneurship and apply the laws concerning to IPR and bioethics	PO 2 PO 3 PO 5



Cauvery College for Women (Autonomous), Trichy -18

Department of Biotechnology

B.Sc., Biotechnology

Learning Outcome Based Curriculum Framework (CBCS - LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semeste	Part	Cours e	Course Title	Course Code	Inst. Hrs.	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC)	Ikkala Ilakkiyam	22ULT1	6	3	3	25	75	100
			Hindi Literature & Grammar – I	22ULH1						
			History of Popular Tales, Literature and Sanskrit Story	22ULS1						
			Basic French – I	22ULF1						
	II	English Language Course- I(ELC)	Functional English for Effective Communication – I	22UE1	6	3	3	25	75	100
	III	Core Course – I (CC)	Cell Biology	22UBT1CC1	5	5	3	25	75	100
		Core Practical - I (CP)	Cell Biology (P)	22UBT1CC1P	3	3	3	40	60	100
		First Allied Course- I (AC)	General Microbiology	22UBT1AC1	4	3	3	25	75	100
		First Allied Course- II (AC)	Biochemistry	22UBT1AC2	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I(AECC)	UGC Jeevan Kaushal-Universal Human Values	22UGVE	2	2	-	100	-	100
	Total				30	22				700
II	I	Language Course - II (LC)	Idaikkala Ilakkiyamum Pudnamum	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar – II	22ULH2						
			Poetry, Textual Grammar and Alakara	22ULS2						
			Basic French – II	22ULF2						
	II	English Language Course -II (ELC)	Functional English for Effective Communication – II	22UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Molecular Biology & Genetics	22UBT2CC2	5	5	3	25	75	100
		Core Practical - II (CP)	Molecular Biology & Genetics (P)	22UBT2CC2P	3	3	3	40	60	100
		Core Course - III (CC)	Bioinstrumentation	22UBT2CC3	3	3	3	25	75	100
		First Allied Course – III (AP)	Microbiology & Biochemistry (P)	22UBT2AC3P	4	3	3	40	60	100

	Ability Enhancement Compulsory Course-II(AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
	Ability Enhancement Compulsory Course-III(AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
	Extra Credit Course	SWAYAM	As per UGC Recommendation						
	Total			30	23				800

III	I	Language Course-III(LC)	Kappiyamum Nadagamum	22ULT3	5	3	3	25	75	100
			Hindi Literature &Grammar – III	22ULH3						
			Prose, Textual Grammar and Vakyarachana	22ULS3						
			Intermediate French – I	22ULF3						
	II	English Language Course-III(ELC)	Learning Grammar Through Literature - I	22UE3	6	3	3	25	75	100
	III	Core Course– IV(CC)	rDNA Technology	22UBT3CC4	6	6	3	25	75	100
		Core Practical - III(CP)	rDNA Technology(P)	22UBT3CC3P	3	3	3	40	60	100
		Second Allied Course-I(AC)	Bioinformatics	22UBT3AC4	4	3	3	25	75	100
		Second Allied Course-II(AP)	Bioinformatics (P)	22UBT3AC5P	4	3	3	40	60	100
	IV	Generic Elective Course- I(GEC)	Basics of Biotechnology	22UBT3GEC1	2	2	3	25	75	100
			Basic Tamil -I	22ULC3BT1						
			Special Tamil - I	22ULC3ST1						
		Extra Credit Course	SWAYAM	As per UGC Recommendation						
Total				30	23				700	

15 Days INTERNSHIP during Semester Holidays*

IV	I	Language Course – IV (LC)	Pandaiya Ilakkiyamum Urainadaiyum	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French – II	22ULF4						
	II	English Language Course –IV (ELC)	Learning Grammar Through Literature – II	22UE4	6	3	3	25	75	100
	II	Core Course – V(CC)	Immunology	22UBT4CC5	6	6	3	25	75	100
		Core Practical - IV(CP)	Immunology (P)	22UBT4CC4P	4	4	3	40	60	100
		Second Allied Course - III(AC)	Basics of Forensic Biology	22UBT4AC6	4	3	3	25	75	100
		Internship*	Internship	22UBT4INT	-	2	-	-	-	100
	I	Generic Elective Course- II(GEC)	Applied Biotechnology	22UBT4GEC2	2	2	3	25	75	100
			Basic Tamil – II	22ULC4BT2						
			Special Tamil - II	22ULC4ST2						
		Skill Enhancement Course –I (SEC)	Medical Lab Technology -I (P)	22UBT4SEC1P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM	As per UGC Recommendation						
		Total			30	25				800

V	II I	Core Course – VI(CC)	Plant Biotechnology	22UBT5CC6	6	6	3	25	75	100
		Core Practical – V(CP)	Plant & Animal Biotechnology (P)	22UBT5CC5P	3	3	3	40	60	100
		Core Course - VII(CC)	Animal Biotechnology	22UBT5CC7	6	6	3	25	75	100
		Core Course – VIII(CC)	Biostatistics	22UBT5CC8	6	6	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. Cancer Biology	22UBT5DSE1A	5	4	3	25	75	100
	B. Human Anatomy and Physiology		22UBT5DSE1B							
	C. Pharmacognosy		22UBT5DSE1C							
	I V	Ability Enhancement Compulsory Course – IV (AECC)	UGC Jeevan Kaushal -Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course –II (SEC)	Medical Lab Technology -II (P)	22UBT5SEC2P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM	As per UGC Recommendation						
Total					30	29				700

VI	II I	Core Course – IX (CC)	Microbial & Environmental Biotechnology	22UBT6CC9	6	6	3	25	75	100
		Core Practical –VI (CP)	Microbial & Environmental Biotechnology (P)	22UBT6CC6P	3	3	3	40	60	100
		Core Course – X (CC)	IPR, Biosafety andBioethics	22UBT6CC10	5	5	3	25	75	100
		Core Course – XI (CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Discipline Specific Elective – II (DSE)	A. D evelopmental Biology	22UBT6DSE2A	5	4	3	25	75	100
	B. Stem Cell Biology		22UBT6DSE2B							
	C. Bioentrepreneurship		22UBT6DSE2C							
	V	Project	Project Work	22UBT6PW	5	4	-	-	100	100
		Gender Studies	Gender Studies	22UGGS	1	1	-	100	-	100
		Extension activity		22UGEA	0	1	0	-	-	-
Total					30	28				700

	Grand Total				180	150				4400

Semester – IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UBT4CC5	IMMUNOLOGY	CORE COURSE – V	6	6

Course Objectives

- To know about the immune system and their functions.
- To learn about humoral and cell mediated immunity.
- To acquire knowledge about the vaccines and its types.
- To study about Principle, Methodology and applications of various Immunological techniques
- To know the significance of various immunological disorders and their remedies

Course Outcome and Cognitive Level Mapping

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO 1	Demonstrate and distinguish the types of lymphoid organ involved in immune system.	K1,K2
CO 2	Describe and Differentiate humoral and Cell mediated immunity	K2, K3
CO 3	Illustrate and justify the Principle, Methodology and applications ELISA, Fluorescent antibody techniques and Monoclonal antibody production	K3, K4
CO 4	Infer the structure and explain the functions of MHC Molecules and different types of Vaccines and clinical transplantation	K5, K6
CO 5	Explain the causes of Immunological Disorders and Tumor Immunity	K6

Mapping of CO with PO and PSOs

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	3	2	2	2
CO2	3	3	3	2	2	3	3	3	2	2
CO3	3	3	3	2	2	3	3	3	2	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation, “3” – Substantial (High) Correlation, “-” indicates there is no Correlation.

**CORE COURSE-V
IMMUNOLOGY**

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Unit I - Basics of Immunology Scope of Immunology, Historical background of Immunology, Biological aspects of Immunology, Self and non-self recognition, specificity, memory of immune system. Antigens: Essential features of Ag, haptens, Carrier molecule, Immunological valence, Antigenic determinants. Primary lymphoid organs (Thymus, Bone marrow), Secondary lymphoid organs (Spleen, Lymph node, MALT). Classification of Immunoglobulins: Types –IgG, IgM, IgA, IgD and IgE (Origin, structural functions)	15	CO1, CO2, CO3	K1, K2, K3,K4
II	Unit II-Types of Immunity Types: Active and passive immunity. Cell mediated immunity and humoral immunity. Natural built in barriers – skin, semen, saliva, tears, enzymes. Mediators of immune system - lymphokines, cytokines, interferon, tumor necrosis factor. Complement components, natural killer cells, macrophages, phagocytosis, pinocytosis. Inflammatory response. Mucosal and Gut associated lymphoid tissue (MALT and GALT) and mucosal immunity. T- Cells and B- Cells: Development, maturation, activation and differentiation.	16	CO1, CO2, CO5	K1, K2, K3,K4
III	Unit III - Immunological techniques Precipitin curve, Immuno diffusion, one and two dimensional, single radial immuno diffusion, Ouchterlony immuno diffusion. Immuno-electrophoresis: Rocket immuno-electrophoresis; Agglutination: Direct and Indirect, Widal test, VDRL test. Radioimmunoassay: ELISA – Principle, Methodology and applications. Fluorescent antibody techniques. Monoclonal antibody	15	CO3, CO4, CO5	K1, K2, K3,K4
IV	Unit IV - MHC, Vaccines and Transplantation Major Histocompatibility Complex : Structure and Functions of MHC I & II molecules; Antigen processing and presentation (Cytosolic and Endocytic pathways) Inactivated, attenuated Recombinant vaccines, Peptide, DNA vaccines and RNA vaccine - Covid vaccine. Synthetic vaccines, plant-based vaccine. Transplantation: Mechanism, Types of Grafts, Graft rejection, General and specific immunosuppressive therapy; Clinical transplantation	15	CO3, CO4, CO5	K1, K2, K3,K4
V	Unit V Immunological Disorders and Tumor Immunity Autoimmunity and its types. Hypersensitivity with examples; Immunodeficiencies - Animal models (Nude and SCID mice), SCID. Types of tumors, tumor Antigens, causes and therapy for cancers	14	CO4, CO5	K1, K2, K3,K4

VI	Self-Study for Enrichment (Not Included for End Semester Examination) Chediak- Higashi syndrome, Leukocyte adhesion deficiency.	-	CO1, CO2,	K1, K2, K3,K4

Text Books

1. A.B. Singh. (2021). *Allergy and Allergen Immunotherapy Unknown Binding*. Apple Academic Press Inc.; 1st edition
2. Lauren M.Sompayrac (2019). *How the Immune system works. 6th Edition*. Wiley Blackwell.
3. Dr.P.Madhav Latha (2018). *A Textbook of Immunology*. S.Chand Publishing.
4. Abul K.Abbas, Andrew H.Lichtman Shiv Pillai.(2017). *Cellular and Molecular Immunology*. 9th Edition Elsevier
5. Warren Levinson Review of Medical Microbiology and Immunology.(2016). Mc Graw Hill Education .
6. Louis Hawley Richard J Ziegler Benjamin L Clarke BRS.(2015). *Immunology and Microbiology (6th Edition)*. Lippincott Williams and Wilkins

Reference Books

1. David Male, R. Stokes Pebbles, Victoria Male.(2020). *Immunology*. Elsevier Health Sciences Publishers.
2. Abul K.Abbas, Andrew H.Lichtman Shiv Pillai.(2019). *Basic Immunology*. Edition. Elsevier
3. Jenni Punt, Sharon Stranford, Patricia Jones, Judith Owen.(2018). *Kuby Immunology*. 8th Edition. ML IE PRNT
4. Peter, J.Delves, Seamus, J.Martin, Dennis R.Burton, Ivan M.Roitt's.(2017). *Essential Immunology*. 1st Edition. Wiley Blackwell
5. Kenneth Murphy. *Casey Weaver Janeway's Immunobiology*.(2016) 9th Edition Garland Science.
6. Kathy M.Durkin(2010). *Understanding the Vaccines and the Immune system*.(2010) 1st Edition Nova Science.Pub.Inc

E-Books

1. <https://archive.org/details/cellular-and-molecular-immunology-10th-edition>
2. <https://www.frontiersin.org/research-topics/463/emerging-immune-functions-of-non-hematopoietic-stromal-cells>
3. https://assets.cambridge.org/97805217/04892/frontmatter/9780521704892_frontmatter.pdf
4. https://drive.google.com/file/d/18n7FAu3MzWqWUZPblrKWtiA_nBM5STTd/view?pli=1
5. <https://www.ncbi.nlm.nih.gov/books/NBK10779/>

Web Links

1. <https://microbenotes.com/immunity/>
2. <https://www.coursera.org/learn/immunology-innate-immune-system>
3. <https://www.bing.com/videos/riverview/relatedvideo?&q=Immune+System+Notes%3a+Diagrams+%26+Illustrations+%7c+Osmosis&qpv=Immune+System+Notes%3a+Diagrams+%26+Illustrations+%7c+Osmosis&mid=55E74851E85FF7ED932255E74851E85FF7ED9322&&FORM=VRD GAR>
4. https://www.osmosis.org/notes/Immune_System
5. <https://geekymedics.com/category/medicine/immunology/>

Pedagogy

Lecture, Power point presentation, Seminar, Assignment, Quiz, Group Discussion,
Video/Animation

Course Designer

Dr.R.UMA MAHESWARI

Semester – IV	Internal Marks: 40	External Marks: 60		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UBT4CC4P	IMMUNOLOGY (P)	CORE PRACTICALS - IV	4	4

Course Objectives

- To study about the Identification of Blood Group.
- To enumerate the Blood Cells
- To study about the Immuno electrophoresis Techniques
- Enable the students with diagnostic skills for identification of certain diseases and immunological techniques.
- To examine viral fever by agglutination test

Course Outcome and Cognitive Level Mapping

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Define and Demonstrate the methods to identify the Blood Cells	K1, K2
CO 2	Elaborate and determine the experiments for Enumeration of Blood Cells	K2, K3
CO 3	Apply the techniques for Plasma and Serum Separation and examine the Blood Group types	K3, K4
CO 4	Criticize the diagnostic skills for different types of Immuno electrophoresis techniques.	K5
CO 5	Explain how the detection of viral fever by slide agglutination tests.	K6

Mapping of CO with PO and PSOs

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	3	2	2	3
CO2	3	3	3	2	2	3	3	3	2	3
CO3	3	3	3	2	2	3	3	3	2	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation, “3” – Substantial (High) Correlation, “-” indicates there is no Correlation.

CORE PRACTICALS-IV IMMUNOLOGY (P)

1. Identification of Cells in a Blood Smear.
2. Blood Cell Counting using Haemocytometer
3. Separation of Serum and Plasma
4. Identification of Blood Group
5. Erythrocyte Sedimentation Rate (ESR).
6. Latex Agglutination Test
7. Single Radial Immunodiffusion
8. Precipitation Reaction – AGD
9. Rocket Immunoelectrophoresis.
10. Testing for Typhoid Antigens - Widal Test
11. AMES TEST
12. DOT ELISA
13. Pregnancy Test – HCG
14. Detection of viral fever by slide agglutination tests.

Reference books

1. Dr. Preeti Sharma, Dr. Pradeep Kumar.(2021).*Basics of Immunology*. First Edition. IP Innovative Publication Pvt. Ltd.
2. Senthilkumar Balakrishnan, Karthik Kaliaperumal, Senbagam Duraisamy.(2017).*Practical Immunology A Laboratory Manual*.LAP LAMBERT Academic Publishing, Germany.
3. Wilmore C.Webley.(2017).*Immunology LaboratoryManual*.LAD Custom Publishing, Georgia.
4. Barbara Detrick, John L Schmitz, Robert G Hamilton(2016).*Manual of Molecular and Clinical Laboratory Immunology*. 8th Edition.ASM Press, Washington, DC.
5. Christine Dorresteyn
6. Stevens.(2016).*Clinical Immunology and Serology: A Laboratory Perspective*.F.A. Davis Company, Philadelphia.

E – Books

1. https://www.avit.ac.in/lab/biomedical_instrumentation_lab/download/17BMES81/lab_manual.pdf
2. https://www.avit.ac.in/lab/biomedical_instrumentation_lab/download/17BMES81/lab_manual.pdf
3. https://www.avit.ac.in/lab/biomedical_instrumentation_lab/download/17BMES81/lab_manual.pdf
4. https://www.avit.ac.in/lab/biomedical_instrumentation_lab/download/17BMES81/lab_manual.pdf
5. https://www.avit.ac.in/lab/biomedical_instrumentation_lab/download/17BMES81/lab_manual.pdf
6. https://www.avit.ac.in/lab/biomedical_instrumentation_lab/download/17BMES81/lab_manual.pdf

Weblinks

1. https://faculty.ksu.edu.sa/sites/default/files/immuno-lecture-1_0.pdf
2. https://www.academia.edu/23738538/Immunology_Lecture_Notes_Immune_Responses

3. <https://archive.nptel.ac.in/courses/102/105/102105083/>
4. <https://microbenotes.com/category/immunology/>
5. <https://www.bing.com/videos/riverview/relatedvideo?&q=Immunology+lab+notes&qpvf=Immunology+lab+notes&mid=5EEC54E35D3C5584F7025EEC54E35D3C5584F702&FORM=VRDGAR>

Pedagogy

Practical Observation, Video and Demo

Course Designer

Dr.R.UMA MAHESWARI

Semester IV	Internal Marks: 25		External Marks: 75	
Course code	Course Title	Category	Hours/Week	Credits
22UBT4AC6	BASICS OF FORENSIC BIOLOGY	SECOND ALLIED COURSE	4	3

Course Objectives

- To develop a comprehensive understanding of the field of forensic biology, including its historical development, various branches, and ethical responsibilities.
- To Gain proficiency in physical evidence identification and crime scene investigation,
- To acquire mastery in Foot, Finger and tyre prints Analysis
- To develop expertise in Fundamental of DNA typing and biological fluid identification examinations.
- To develop knowledge about entomology and forensic anthropology and contribute to criminal investigations effectively.

Course outcome and Cognitive Level Mapping

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Knowle dge Level
CO 1	Analyze the multifaceted field of forensic biology and ethical considerations to gain a comprehensive understanding.	K1, K2
CO 2	Utilize course knowledge and evidence-based techniques to address intricate forensic challenges.	K2
CO 3	Evaluate the ethical obligations in forensic biology demand impartiality, meticulous chain of custody, and unwavering commitment to preserving evidence integrity.	K3, K4
CO 4	Apply acquired skills to actively contribute to forensic investigations, aiding in crime scene reconstruction, suspect identification, and victim analysis.	K4, K5
CO 5	Utilize forensic methods, like DNA profiling, serology, and entomology for interpreting biological evidence in diverse criminal cases	K6

Mapping of CO with PO and PSOs

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	3	3	2	3	1	1	2	3
CO2	3	1	3	2	3	2	2	1	1	3
CO3	2	1	2	2	1	2	2	2	3	3
CO4	2	1	2	2	2	1	1	2	2	3
CO5	3	1	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,
“3” – Substantial (High) Correlation, “-” indicates there is no Correlation.

**SECOND ALLIED COURSE-III
BASICS OF FORENSIC BIOLOGY**

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to Forensic Biology: Forensic Science - Definition - Development of Forensic science in India - Organization and functions of Forensic laboratory. Documents identification: Questioned documents, identification of hand writing, type writer and forged signatures- Erasures and alterations on documents and their detection	14	CO1, CO2, CO3	K1, K2, K3,K4
II	Physical evidences and Crime Scene examinations Physical evidences: classification and significance - Locard's Principle of exchange class and individual characteristics. Crime Scene examinations - documentation of crime scene- recognition, collection, preservation and transportation of physical evidence for laboratory examinations. Fundamentals of photography - crime scene photography.	16	CO1, CO2, CO3	K1, K2, K3,K4
III	Foot and Finger prints Analysis Foot and tyre impressions - Walking pattern - Recording and examination of foot prints and tyre prints. Finger prints - Fundamental principles - Finger print patterns - classification of finger prints -methods of developments of latent finger prints. .	15	CO1, CO4, CO5	K1, K2, K3,K4
IV	Examination of biological fluid: Examination of biological fluids - blood, seminal and saliva stains - forensic characterization of the above stains - stain patterns of the blood, Examination of fibres, hair, bones, teeth and skull - Fundamental of DNA typing.	15	CO1, CO2, CO5	K1, K2, K3,K4
V	Entomology and Skeletal Analysis: Role of Entomology in Forensic Investigations: Insect Succession: Forensic Anthropology and its role in the criminal investigations. Skeletal Analysis: Techniques for age, sex, and ancestry determination from skeletal remains.	15	CO1, CO2, CO3	K1, K2, K3,K4
VI	Self-Study for Enrichment Satellite DNA (Not Included for End Semester Examination)	-	CO1, CO2, CO3	K1, K2, K3

TEXT BOOKS

1. James, S. H., & Nordby, J. J. (2002). *Forensic science: an introduction to scientific and investigative techniques*. CRC press.
2. Hall, A. B., & Saferstein, R. (2020). *Forensic Science Handbook, Volume I*. CRC Press.
3. Saferstein, R. (2004). *Criminalistics: An introduction to forensic science*.
4. Li, R. (2015). *Forensic biology*. CRC press.
5. Amankwaa, A. O. (2019). *Forensic DNA databasing: retention regimes and efficacy*. University of Northumbria at Newcastle (United Kingdom).

REFERENCE BOOKS

1. Carroll, K. (2020). *Forensic Science: Fundamentals and Investigations*.
2. Butler, J. M. (2005). *Forensic DNA typing: biology, technology, and genetics of STR markers*. Elsevier.
3. Christensen, A. M., Passalacqua, N. V., & Bartelink, E. J. (2019). *Forensic anthropology: current methods and practice*. Academic Press.
4. Sharma B.R., (2020). *Forensic Science in Criminal Investigation and Trials*. 6th Edition. Lexis Nexis.
5. Pande, B.B (2022). *Criminal Law and Criminal Justice: Advanced Legal Writings*. Eastern Book Company.

E-BOOKS

1. <https://www.pdfdrive.com/forensic-science-an-introduction-to-scientific-and-investigative-techniques-fourth-edition-e158235953.html>
2. <https://www.pdfdrive.com/scientific-method-applications-in-failure-investigation-and-forensic-science-international-e160960612.html>
3. <https://www.pdfdrive.com/forensic-science-fundamentals-and-investigations-1st-edition-e26447548.html>
4. <https://www.pdfdrive.com/introduction-to-forensic-sciences-cnqzu-e17458427.html>

PEDAGOGY

Chalk and talk, PPT, Group Discussion, Assignment, Demo, Quiz, Seminar

COURSE DESIGNER

Dr. R. RAMESHWARI

Semester – IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UBT4GEC2	APPLIED BIOTECHNOLOGY	GENERIC ELECTIVE COURSE	2	2

Course Objectives

- To appreciate the role of biotechnology which increase the productivity and protect crops from damage or infestation.
- To impart knowledge about the application of biotechnology to improve the edibility, texture and nutritional composition of food.
- To understand how biotechnology is applied to address environmental problems such as removal of pollution and maintain quality standards.
- To familiarize with the basic concepts of innovative techniques for diagnosing, treating and preventing diseases.
- To understand the policies, rules, and procedures related to biosafety.

Course Outcome and Cognitive Level Mapping

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Define and outline the significant applications of biotechnology in improving human health.	K1, K2
CO2	Relate the role of biotechnology in monitoring and controlling pollution for sustainable environment.	K2
CO3	Summarize and utilize several molecular techniques for disease diagnosis, treatment and prevention for the betterment of human health.	K2, K3
CO4	Identify potential hazards pertaining to biosafety for the protection of laboratory workers, public, and the environment.	K3
CO5	Infer biotechnological applications that facilitate healthier lives & positively impact society.	K4

Mapping of CO with PO and PSOs

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	1	3	3	1	1	1
CO2	3	1	3	1	1	3	3	1	1	2
CO3	1	3	3	1	1	3	2	1	1	1
CO4	3	2	3	3	2	3	3	1	1	2
CO5	3	3	3	2	1	3	3	1	1	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,
“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

**GENERIC ELECTIVE COURSE-II
APPLIED BIOTECHNOLOGY**

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Biotechnology in Agriculture: History, Genetically modified Crops – Advantages and Applications - Bt Cotton, Bt Brinjal (Pest resistant), GM Mustards (Herbicide Tolerant), Flavr Savr Tomato (Shelf life improvement), Golden Rice (Rich in Vitamin A), Soybean (Rich in oleic acid content).	6	CO1, CO2	K1, K2, K3, K4
II	Biotechnology in Food: Principle of Fermentation process. Production of food products – Bread, Dairy, Confectionery and Beverages, Meat, Poultry and Fish products. Food processing and preservation.	7	CO2, CO3	K1, K2, K3, K4
III	Biotechnology in Environment: Pollution – Source & types. Health hazards due to pollution. Xenobiotics. Detection of Environmental pollutant - Biosensors. GMOs in Environmental clean-up. Health and Hygiene. Environmental standards and Quality monitoring	5	CO2, CO4	K1, K2, K3, K4
IV	Biotechnology in Medicine: Molecular diagnosis – PCR, ELISA, monoclonal antibodies; Gene therapy – Somatic & Germline; Genetically engineered product - recombinant insulin, Tissue plasminogen activator & Vaccine.	7	CO1, CO3	K1, K2, K3, K4
V	Biosafety guidelines and regulations - Importance and Operation. Role of Biosafety Committees - IBSC, RDAC, RCGM, GEAC. Environmental release of GMOs, Risk assessment and management.	5	CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment (Not Included for End Semester Examination) ELSI - Ethical Legal & Social Implications of Biotechnology	-	CO4, CO5	K1, K2, K3, K4

Text Books

1. Dubey, R. C. (2022). *A text book of Biotechnology*. 2022 Edition. S Chand Publication.
2. Thieman, W. J. & Palladino, M. A. (2021). *Introduction to Biotechnology*. 4th Edition. Pearson Publishers.
3. Satyanarayana, U. (2020). *Biotechnology*. Books and Allied Ltd. Publishers.
4. Karp, G., Iwasa, J., Marshall, W. (2019). *Karp's Cell and Molecular Biology*. 9th Edition. Willey Publishers.
5. Das, H. K. (2017). *Textbook of Biotechnology*. 5th Edition. Willey Publishers.

Reference Books

1. Khan, F. A., Taylor, F. (2020). *Biotechnology Fundamentals*. 3rd Edition. Taylor and Francis Publishers.
2. Lal, R. (2020). *An Introduction to Biotechnology*. Dreamtech Press Publishers.
3. Irvine, D. (2018). *An Introduction to Genetic Engineering*. Syrawood Publishing House.
4. Glick, B. R. (2018). *Molecular Biotechnology: Principles and Applications of Recombinant DNA*. 5th Edition Indian Reprint. ASM Press Publishers.
5. Griffith, R. (2017). *Cell biology (Meiosis & Mitosis)*. Larsen and Keller Education Publishers.

E Books

1. <https://www.pdfdrive.com/basic-and-applied-aspects-of-biotechnology-e158085236.html>
2. <https://www.pdfdrive.com/molecular-biotechnology-principles-and-applications-of-recombinant-dna-d33452385.html>
3. <https://www.infobooks.org/free-pdf-books/biology/biotechnology/>
4. <https://www.sciencedirect.com/book/9781907568282/an-introduction-to-biotechnology>
5. <https://vulms.vu.edu.pk/Courses/BT301/Downloads/Basic%20Biotechnology-Third%20Edition.pdf>
6. <https://ncert.nic.in/textbook/pdf/lebo111.pdf>

Web Links

1. <https://thunderbooks.files.wordpress.com/2009/05/introduction-to-biotechnology-and-genetic-engineering-infinity-2008.pdf>
2. <https://www.sciencedirect.com/book/9780128012246/biotechnology-for-beginners>
3. <https://www.medicosrepublic.com/biotechnology-2nd-edition-pdf-free-download/>
4. https://www.academia.edu/36555620/Biotechnology_Book
5. <https://www.ncbi.nlm.nih.gov/pubmed/>

Pedagogy

Chalk and Talk, PPT, Videos and Animations

Course Designer

Ms. P. JENIFER

Semester – IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UBT4SEC1P	MEDICAL LAB TECHNOLOGY - I (P)	SKILL ENHANCEMENT COURSE –I	2	2

Course Objectives

- To learn and execute various techniques in medical lab techniques.
- To perform hands on training on various immunotechniques, biochemical parameters of urine, various body fluid.
- To study hematological parameters, analysis of various parameters of Immunology involved in the normal health of human.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate the basic principles of important techniques in hematology	K1
CO2	Analyze and determine the constituents of blood samples	K2
CO3	Perform basic blood cell counting using various methods	K2
CO4	Apply the knowledge on serological parameters.	K3
CO5	Identify and analyze the parameters for pathological conditions	K3

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1	3	3	2	3	1
CO2	3	3	3	2	1	3	2	2	3	1
CO3	3	3	2	2	1	3	2	2	2	2
CO4	3	3	3	3	1	3	2	2	3	1
CO5	3	3	2	3	1	3	2	2	2	1

“1” – Slight (Low) Correlation,

“3” – Substantial (High) Correlation,

“2” – Moderate (Medium) Correlation,

“-” indicates there is no correlation.

SKILL ENHANCEMENT COURSE – I MEDICAL LAB TECHNOLOGY - I (P)

1. Anticoagulant vial preparation.
2. Complete Blood Counts.
3. Determination of Hemoglobin.
4. TRBC Count by Hemocytometers.
5. Differential Leukocyte count.
6. Determination of Platelet Count.
7. Determination of ESR by Wintrobe's.
8. Determination of ESR by Westergreen's method.
9. Determination of PCV by Wintrobe's.
10. Erythrocyte Indices- MCV, MCH, MCHC.
11. Absolute Eosinophil Count.

Reference Books

1. Sainani G. S., Rajesh G Sainani. (2018). *A Manual of Clinical and Practical Medicine. Second Edition*. Jaypee Publishers, Chennai.
2. Gupta. Talwar. (2006). *A Handbook of Practical and Clinical Immunology*. CBS publishers, India.
3. Hannah D.Zane. (2001). *Immunology, Theoretical and Practical Concepts in Laboratory Medicine*. Saunders Publishers, UK.
4. Krishna Das.KV.(2013). *Clinical Medicine, A Text Book of Clinical Methods and Laboratory Investigations*. Jaypee publishers, Chennai.
5. Baker.F.J, Selverton.R.E. *Introduction To Medical Laboratory Technology. Seventh Edition*. Elsevier, USA.

E books

1. <https://www.pdfdrive.com/a-manual-of-laboratory-and-diagnostic-tests-e157742334.html>
2. <https://www.pdfdrive.com/lippincott-manual-of-nursing-practice-e189815788.html>
3. <https://www.pdfdrive.com/introduction-to-genetic-analysis-solutions-megamanual-e158762003.html>

Web links:

1. <https://egyankosh.ac.in/bitstream/123456789/16314/1/Experiment-8.pdf>
2. [https://uou.ac.in/sites/default/files/slm/MSCBOT-510\(L\).pdf](https://uou.ac.in/sites/default/files/slm/MSCBOT-510(L).pdf)
3. <https://vlab.amrita.edu/?sub=3&brch=76&sim=1089&cnt=1>
4. https://webstor.srmist.edu.in/web_assets/srm_mainsite/files/files/BT0213%20-%20CELL%20BIOLOGY%20PRACTICAL%20MANUAL.pdf
5. https://www.iitg.ac.in/cseweb/vlab/anthropology/procedure_mendels.html

Pedagogy

Practical Observation, Video and Demo

Course Designers

Dr. M. KEERTHIGA

SEMESTER V

Semester V	Internal Marks : 25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UBT5CC6	PLANT BIOTECHNOLOGY	CORE COURSE-VI	6	6

Course Objectives:

- To know the basic principles and techniques involved in plant tissue culture.
- To study the importance of plant models.
- To acquire knowledge about the concepts of transformation in Plant Biotechnology.
- To understand the achievements of biotechnology in plant system.
- To explore and understand the diverse applications of molecular markers in plant breeding.

Course outcome and Cognitive Level Mapping

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Demonstrate a comprehensive understanding of plant biotechnology, encompassing plant tissue culture, genome organization, transgenic plant technology, biofertilizers, and molecular breeding techniques.	K1, K2
CO2	Develop practical skills in establishing and maintaining plant tissue cultures, including media preparation, explant selection, and regeneration techniques for plant propagation.	K2
CO3	Gain proficiency in analyzing plant genome organization, including nuclear, chloroplast, and mitochondrial genomes, and apply this knowledge to genetic studies and plant breeding.	K3
CO4	Evaluate the principles and applications of transgenic plants, including their role in biotic and abiotic stress resistance, crop improvement, and biosafety considerations.	K4
CO5	Acquire the ability to apply molecular techniques, such as DNA markers, linkage analysis, and QTL mapping, in modern plant breeding practices, while adhering to ethical and biosafety standards.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	1	3	3	1	1	1
CO2	3	1	3	1	1	3	3	1	1	2
CO3	1	3	3	1	1	3	2	1	1	1
CO4	3	2	3	3	2	3	3	1	1	2
CO5	3	3	3	2	1	3	3	1	1	2

“1” – Slight (Low) correlation

“3” – Substantial (High) correlation

“2” - Moderate (Medium) correlation

“_” indicates there is no correlation

**CORE COURSE-VI
PLANT BIOTECHNOLOGY**

Unit	Content	Hours	COs	Cognitive Level
I	Plant Tissue Culture and Regeneration Techniques Introduction to Plant Tissue Culture and Culture Media: History and significance of plant tissue culture. Types of culture media: solid vs. liquid, basal vs. specialized. Composition and preparation of culture media. Sterilization techniques for culture media and equipment. Explant selection criteria and preparation.	17	CO1, CO2, CO3	K1, K2, K3, K4, K5
II	Plant Tissue Culture and Somaclonal Variations: Types of culture (Callus, Suspension, Meristem, Embryo, Anther and Root). Regeneration Methods and Somaclonal Variations: Organogenesis: Shoot and Root formation. Somatic embryogenesis. Somaclonal variations: Production of Haploids. Nurturing and manipulating protoplasts: Culture and regeneration strategies. Fusion of protoplasts: Techniques, significance.	19	CO1, CO2, CO3,	K1, K2, K3, K4, K5
III	Deciphering <i>Arabidopsis thaliana</i> Genome Organization Introduction to <i>Arabidopsis thaliana</i> as a premier model plant species : Landscape of the nuclear genome in <i>Arabidopsis thaliana</i> - Structure and functions of the chloroplast genome - Mitochondrion and its Genome. Cytoplasmic Male Sterility in plants: Mechanisms, applications, and implications.	18	CO1, CO2, CO3,	K1, K2, K3, K4, K5
IV	Introduction to Transgenic Plants Genetic engineering and crop improvement – Agrobacterium-mediated transformation: Transgenic plants: Biotic stress resistance (Insect) BT Cotton, BT Mustard, BT Brinjal), Virus, Bacteria). Abiotic stress resistance (Herbicide, Drought). Applications of Plant genetic Engineering Improvement : (Flavr savr tamato, Golden Rice. Transformation techniques: GUS assay, Neomycin resistance assay).	20	CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Applications of Molecular Markers in Plant Breeding DNA Hybridization-Based Molecular Markers (RFLP) – PCR-Based Molecular Markers (RAPD, AFLP, STS, SNPs, Microsatellites) Genomic enabled breeding methods.	16	CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not Included for End Semester Examination) Thermosensitive genic Male sterility (TGMS), Production of Organic food, Linkage analysis and Quantitative Trait Loci.	-	CO2, CO3, CO4	K1, K2, K3, K4, K5

Text Books

1. Smith, R. H. (2012). Plant tissue culture: techniques and experiments. academic press. recent reprint of this book
2. Stewart Jr, C. N. (Ed.). (2016). *Plant biotechnology and genetics: principles, techniques, and applications*. John Wiley & Sons.
3. Abdin, M. Z., Kiran, U., & Ali, A. (Eds.). (2017). *Plant biotechnology: principles and applications*. Springer Singapore.
4. Altman, A., & Hasegawa, P. M. (Eds.). (2011). *Plant biotechnology and agriculture: prospects for the 21st century*. Academic press.
- 5 Singh, B. D., & Singh, A. K. (2015). Marker-assisted plant breeding: principles and practices.

Reference Books

1. Bhojwani, S. S., & Razdan, M. K. (1996). Plant tissue culture: theory and practice. (No Title).
2. Janick, J. (Ed.). (2010). *Plant Breeding Reviews, Volume 23* (Vol. 23). John Wiley & Sons.
3. Nelson, G. C. (2001). *Genetically modified organisms in agriculture: economics and politics*. Elsevier.
4. Gahlawat, S. K., Salar, R. K., Siwach, P., Duhan, J. S., Kumar, S., & Kaur, P. (Eds.). (2017). *Plant biotechnology: recent advancements and developments* (pp. 1-390). Singapore:: Springer.
5. Primrose, S. B., & Twyman, R. (2009). *Principles of genome analysis and genomics*. John Wiley & Sons.

E - books

1. <https://www.pdfdrive.com/plant-tissue-culture-third-edition-techniques-and-experiments-e189228999.html>
2. <https://www.pdfdrive.com/plant-tissue-culture-an-introductory-text-e157392516.html>
3. <https://www.pdfdrive.com/plant-biotechnology-and-genetics-principles-techniques-e15853574.html>
4. <https://www.pdfdrive.com/plant-biotechnology-volume-1-principles-techniques-and-applications-e158415461.html>
5. <https://www.pdfdrive.com/plant-biology-and-biotechnology-volume-ii-plant-genomics-and-biotechnology-e176062706.html>

Web References

1. https://r.search.yahoo.com/_ylt=AwrKAluRmB9lCrYGyy3nHgX.;_ylu=Y29sbwMEcG9zAzUEdnRpZAMEc2VjA3Ny/RV=2/RE=1696598289/RO=10/RU=https%3a%2f%2fonlinecourses.nptel.ac.in%2fnoc20_bt36%2fpreview/RK=2/RS=uV1eGcoCnfbF4aAAhBpmHWdAv0U-
2. https://r.search.yahoo.com/_ylt=Awr1TcjWmB9lTA8EdArnHgX.;_ylu=Y29sbwMEcG9zAzMEdnRpZAMEc2VjA3Ny/RV=2/RE=1696598358/RO=10/RU=https%3a%2f%2fnipb.icar.gov.in%2f/RK=2/RS=Nk74kvGCmXV1VpTJfggqTjY_G0o-

Pedagogy

Blackboard, PPT, Videos, Animations, Group Discussion and Quiz.

Course Designer

Dr. R. RAMESHWARI

Semester – V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UBT5CCP	PLANT AND ANIMAL BIOTECHNOLOGY (P)	CORE PRACTICAL	3	3

Course Objectives

- To get trained in maintaining aseptic conditions in animal cell culture.
- To provide a better understanding of various analytical techniques
- To operate and maintain common bio instruments effectively and safely.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Enumerate the cells using hemocytometer	K1
CO2	Explain to maintain aseptic conditions in tissue culture lab	K2
CO3	Demonstrate the method of DNA isolation from various sources and identification in agarose gel electrophoresis.	K2
CO4	Illustrate to culture and maintain animal cell cultures, various method of preservation and counting of viable cells	K3
CO5	Analyze the skills and basic techniques in culturing cells using primary and secondary methods	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	1	3	1	2	3	1
CO2	3	2	2	2	1	3	2	2	2	1
CO3	3	3	2	2	2	3	3	2	2	1
CO4	3	3	2	3	1	3	3	2	3	1
CO5	3	3	3	3	1	3	3	3	3	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,
“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

CORE PRACTICAL – V

PLANT AND ANIMAL BIOTECHNOLOGY (P)

1. Introduction to safety and aseptic maintenance of tissue culture laboratory.
2. Isolation of Plant genomic DNA.
3. Isolation of protoplast from spinach leaves by mechanical and enzymatic methods.
4. Protoplast fusion by using polyethylene glycol.
5. Isolation of genomic DNA from animal liver tissue.
6. Quantification of DNA by Spectrophotometric method.
7. Identification of stages during chick embryo development.
8. Assessment of cell viability by cell counting in Haemocytometer.
9. Preparation of animal tissue culture media.
10. Establishment of Primary cell culture *
11. Establishment of Secondary cell culture *
12. Cryopreservation and thawing of cells*

Reference Books

1. Freshney, R. I. (2015). *Culture of animal cells: a manual of basic technique and specialized applications*. John Wiley & Sons.
2. Kasper, C., Charwat, V., & Lavrentieva, A. (Eds.). (2018). *Cell culture technology*. Berlin/Heidelberg, Germany: Springer International Publishing.
3. Thatoi, H., Dash, S., & Das, S. K. (2017). *Practical Biotechnology: Principles and Protocols*. IK International Publishing House.
4. Wilkie, S., Clark, M. S., Leroy, P., Merlino, M., Nègre, S., Caissard, J. C., ... & Bernard, M. (1997). Genomic DNA isolation, southern blotting and hybridization. In *Plant Molecular biology—a laboratory manual* (pp. 3-53). Berlin, Heidelberg: Springer Berlin Heidelberg.
5. Stewart Jr, C. N. (Ed.). (2016). *Plant biotechnology and genetics: principles, techniques, and applications*. John Wiley & Sons.

E books

1. https://www.academia.edu/21781061/Lab_in_Industrial_Plant_and_Animal_Biotechnology_Students_Manual
2. https://kau.in/sites/default/files/documents/a_plant_biotechnology_laboratory_manual.pdf
3. <https://www.bio.org>
4. <https://www.asas.org>
5. <https://www.asas.org>

Pedagogy

Practical Observation, Video and Demo

Course Designers

Ms. R. NEVETHA

Semester – V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UBT5CC7	ANIMAL BIOTECHNOLOGY	CORE COURSE	6	6

Course Objectives

- To understand the basic requirements and techniques about Animal Cell Culture.
- To provide the knowledge about the manipulation of Embryo.
- To provide basic concepts about Cloning.
- To provide an overview and current developments in different areas of animal biotechnology.
- To learn propagation of embryonic stem cells, nuclear transfer technology, animal cloning and stem cell differentiation

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Explain the fundamental scientific principles that underlie cell culture and its importance	K1
CO2	Acquire knowledge for isolation, maintain and growth of cells.	K2
CO3	Develop techniques for the production of Growth Hormones, monoclonal antibodies etc.	K3
CO4	Explain proficiency in establishing and maintaining of cell lines.	K3
CO5	Analyze principles and applications of animal cloning and gene therapy along with ethical concerns.	K1

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	1	3	1	2	3	1
CO2	3	2	2	2	1	3	1	2	2	1
CO3	3	3	2	2	1	3	3	2	2	1
CO4	3	3	2	2	1	3	3	2	3	1
CO5	3	3	3	3	1	3	3	3	3	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,
“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

**CORE COURSE VII
ANIMAL BIOTECHNOLOGY**

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Animal Cell Culture: Animal cell culture - Lab Facilities – Infrastructure- Equipment – Culture Vessels. Media Composition – Types – Natural – Synthetic – Semisynthetic – Freezing Media. Reagents – Antibiotics – Trypsin – Indicators.	17	CO1, CO2	K1, K2, K3, K4
II	Types of Animal Cell Culture: Types of Cultures – Primary – Secondary – Established Cultures. Culture – Finite – Continuous Culture - Histotypic – Organotypic. Biology of Cultured Cells – Cell Synchronization – Cell Viability – Cytotoxicity.	17	CO1, CO2, CO3	K1, K2, K3, K4
III	Gene transfer and Developmental Biology: Gene transfer methods in Animals –Physical - Chemical - Biological methods. Hybridoma technology. Gametogenesis. Stages of embryonic development – Morula, Blastulation, Gastrulation and Organogenesis. Cryopreservation - Sperm - Ova - Embryo of livestock. Artificial Insemination - Super ovulation - In vitro Fertilization- Culture of Embryos - Embryo transfer- Embryo Splitting- Embryo Sexing.	20	CO3, CO4, CO5	K1, K2, K3, K4
IV	Trangensis: Animal Cloning - Basic Concepts. Cloning from Embryonic Cells - Adult cells. Cloning of different Animals - Transgenic Animals – Mice – Sheep - Fish. Products from Transgenic Animals – Insulin – Growth Hormones – Blood Clotting Factors. Merits - demerits. Global Ethical Challenges in Animal Biotechnology	19	CO3, CO4, CO5	K1, K2, K3, K4
V	Gene Therapy: Gene Therapy - Types of Gene Therapy- Somatic – Germline Gene Therapy. Approaches – Ex vivo – In vivo Gene Therapy. Gene knock out technology.	17	CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment Introduction and History of Animal Biotechnology (Not Included for End Semester Examination)	-	CO1, CO2	K1, K2, K3

Text Books

1. Verma, A. S., & Singh, A. (Eds.). (2020). *Animal biotechnology: models in discovery and translation 2nd edition*. Academic Press.
2. Singh, B., Mal, G., Gautam, S. K., & Mukesh, M. (2019). *Advances in animal biotechnology*. Springer International Publishing.
3. Scherman, D. (Ed.). (2019). *Advanced textbook on gene transfer, gene therapy and genetic pharmacology: principles, delivery and pharmacological and biomedical applications of nucleotide-based therapies*. World Scientific.

4. Niemann, H., & Wrenzycki, C. (Eds.). (2018). *Animal Biotechnology*. Springer.
5. Gwiasda, K. E., Allender-Hagedorn, S., Chang, Y. Y., Eun, J. Y., Marino, P., Swales, J. M., ... & Dalrymple, L. (2000). Bibliography: Relations of Science to Literature and the Arts 1998. *Configurations*, 8(3), 429-562.

Reference Books

1. Thieman, W. J., & Palladino, M. A. (2009). *Introduction to Biotechnology*. 2nd.
2. Lakshmipathy, U., & Thyagarajan, B. (2011). *Primary and stem cells: gene transfer technology applications*. John Wiley & Sons.
3. Ranga, M. M. (2017). *Animal biotechnology*. Student Edition.
4. Verma, A. S., & Singh, A. (Eds.). (2013). *Animal biotechnology: models in discovery and translation*. Academic Press.
5. van Zutphen, L. F. M. (1998). *Animal Biotechnology and Ethics*. Edited by Alan Holland and Johnson (1998). Chapman and Hall: London. 352pp. Hardback. Obtainable from the publisher Row, London SE1 8HN, UK (ISBN 0412756803). Price£ 49.00. *Animal Welfare*, 7(4), 465-4

E books

1. <https://mis.alagappauniversity.ac.in/siteAdmin/dde-admin/uploads/4/ PG M.Sc. Zoology 350%2042 Animal%20Biotechnology MSC%20ZOOLOGY 6335.pdf>
2. <https://nap.nationalacademies.org/read/10418/chapter/1>
3. <https://www.vet-ebooks.com/biotechnology-in-animals-husbandry/>
4. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/GBT1305.pdf
5. <https://www.kobo.com/in/en/ebook/animal-biotechnology>

Web links

1. https://onlinecourses.swayam2.ac.in/cec22_bt07/preview
2. <https://nptel.ac.in/courses/102104059>
3. <https://www.khanacademy.org/science/ap-biology/gene-expression-and-regulation/biotechnology/v/dna-cloning-and-recombinant-dna>
4. <https://www.khanacademy.org/science/in-in-class-12-biology-india/x09ed98f7a9e671b:biotechnology-and-its-applications/x09ed98f7a9e671b:introduction/a/transgenic-animals>
5. <https://byjus.com/biology/transgenic-animals/>

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment, Animations.

Course Designers

Ms. R. NEVETHA

Semester – V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UBT5DSE1A	CANCER BIOLOGY	DISCIPLINE SPECIFIC ELECTIVE – I	5	4

Course Objectives

- To identify mutations in signal molecules and receptors for cancer Proliferations.
- To learn the risks of cancer treatment (experimental and non-experimental)
- To prevent the occurrence of cancer and to get awareness about prevalence of cancer
- To analyze the genetic and environmental factors which causes cancer
- To enhance the skills in clinical examination techniques biopsy, blood tests for cancer detection.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Demonstrate a comprehensive understanding of the hallmarks of cancer, the regulation of the cell cycle, and the role of mutations in signal molecules and receptors in cancer development.	K1, K2
CO2	Compare and Contrast the genetic and environmental factors that contribute to the development of cancer, and assess their relative impacts.	K2, K3
CO3	Examine and Interpret two intricate mechanisms of cell cycle regulation, including the role of cyclin-dependent protein kinases (CDKs) and CDK inhibitors in cancer, and how these can be targeted in therapy.	K3, K4
CO4	Analyse and Examine the proficiency in the diverse treatment modalities for cancer, including chemotherapy, radiotherapy, immunotherapy, gene therapy, stem cell therapy, and surgical interventions, and understand their applications in different cancer types and stages.	K4, K5
CO5	Explain the skills in clinical examination techniques biopsy, blood tests, etc. and diagnostic imaging (X-rays) for cancer detection. They will also comprehend advances in cancer detection methods, enhancing their ability to assess and adopt emerging technologies in cancer diagnosis.	K6

Mapping of CO with PO and PSOs

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	3	2	2	2	2
CO3	3	3	2	2	2	3	2	2	2	2
CO4	3	3	3	2	2	2	2	2	2	2
CO5	3	3	3	2	3	1	3	2	3	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

DISCIPLINE SPECIFIC ELECTIVE – I
CANCER BIOLOGY

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Unit I-Fundamentals of cancer biology Hallmarks of cancer. Regulation of Cell cycle, Mutations that cause changes in signal molecules, effects on receptor, signal switches, tumour suppressor genes, Modulation of cell cycle-in cancer, Different forms of cancers.	15	CO1, CO2, CO3	K1, K2, K3, K4, K5, K6
II	Unit II- Causative Agents of Cancer Biology - Genetic Factor, Viruses, Hormones. Lifestyle and Dietary factors, Alcohol consumption and smoking. Environmental and occupational Exposure - Chemical carcinogens and Mutagens.	13	CO1, CO2, CO3	K1, K2, K3, K4, K5, K6
III	Unit III- Biology of Cancer Cells Cell Cycle Regulation in Cancer Cell. Cyclin Dependent Protein Kinase, CDK inhibitors. Apoptosis. Molecular Mechanism-Intrinsic and Extrinsic pathway. Oncogene and Tumor suppressor gene-p53. Metastasis and Angiogenesis.	15	CO2, CO3, CO4	K1, K2, K3, K4, K5, K6
IV	Unit IV- Cancer Diagnosis Clinical Examination by Biopsy: Bone marrow Biopsy, Skin Biopsy-Shave biopsy, Punch biopsy, Incisional biopsy, Excisional biopsy. Blood Test-RBC, WBC, Platelets Count, Pap Test. Imaging-X-ray, Endoscopy, Mammography.	15	CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Unit V- Cancer therapy Different forms of therapy Chemotherapy, Radiotherapy, Immunotherapy, Gene therapy, Stem Cell Therapy and Surgery Advances in Cancer detection.	15	CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self - Study for Enrichment (Not included for End Semester Examination) Prediction of aggressiveness of Cancer	-	CO1, CO2, CO3	K1, K2, K3, K4, K5, K6

Text Books

1. Gibbons, J. P. (2020). *Khans the Physics of Radiation Therapy with Access Code 6ed*. LWW US Reprint.
2. Edward Chu, Vincent T. Devita Jr. (2019). *Physicians' Cancer Chemotherapy Drug Manual*. Jones and Bartlett Publishers, Inc; 19th edition.
3. Philip J. DiSaia MD William T. Creasman MD, Robert S MannelMD (2017) *Clinical GynecologicOncology*. Elsevier; 9th edition.
4. Clifford L. K. Pang. (2015) *Hyperthermia in Oncology,1st Edition*. CRC Press
5. Robert, E. Bristow, BethY.Karlan, Dennis S. Chi (2015). *Surgery for Ovarian Cancer*, 3rd Edition. CRC Press

Reference Books

1. Sayan Paul (2020). *The Bethesda Handbook of Clinical Oncology* - Wolters Kluwer India Pvt. Ltd.
2. Devita V. T. (2019). *Evita hellman and Rosenbergs cancer principles and Practice of oncology 11ED (HB 2019)*. LWW; 11th edition.
3. Dr. Pradeep Kumar (2022). *The Textbook of Cancer Biology*. Prachi Digital Publication.
4. Anjali Susan John Elizabeth John. (2021). *An Overview on Cancer*. Bluerose Publishers Pvt. Ltd.
5. Lakshmi Kalpana, V., Anuradha, A. (2021). *A Textbook of Medical Genetics and Cancer Genetics*. IP Innovative Publication Pvt. Ltd
6. Lauren Pecorino., *MOLECULAR BIOLOGY OF CANCER 5E: Mechanisms, Targets, and Therapeutics*. (2021). OUP Oxford; 5th edition.

Web Links

1. <https://www.onlinebiologynotes.com/cancer-etiology-pathophysiology-types-diagnosis-and-treatment/>
2. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBT1606.pdf
3. <https://archive.nptel.ac.in/courses/108/108/108108124/>
4. <https://www.cancer.gov/about-cancer/understanding/what-is-cancer>
5. <https://www.mayoclinic.org/diseases-conditions/cancer/symptoms-causes/syc-20370588>
6. <https://my.clevelandclinic.org/health/diseases/12194-cancer>

E-Books

1. https://ia801205.us.archive.org/14/items/CancerBiology_201607/cancer%20biologpf
2. <https://link.springer.com/book/10.1007/978-3-030-57254-9>
3. https://ia801205.us.archive.org/14/items/CancerBiology_201607/cancer%20biology.pf
4. https://mis.kp.ac.rw/admin/admin_panel/kp_lms/files/digital/Core%20Books/Biology/Cancer%20Biology.pdf
5. <https://redir.booklibrary.website/library/cancer-biology-and-therapy.pdf>

Pedagogy

Lecture, Power point presentation, Seminar, Assignment, Quiz, Group Discussion, Video/Animation

Course Designer

Dr. R. UMA MAHESWARI

Semester – V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UBT5DSE1B	HUMAN ANATOMY AND PHYSIOLOGY	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives

- To study the levels of structural organization and classification of tissues and organs of human body.
- To familiarize with the working pattern of integumentary and respiratory system of human.
- To know the anatomy and working function of human nervous and cardiovascular system.
- To understand the structure, types and functions of muscular and skeletal system.
- To learn about the basic anatomy and function of urinary and reproductive system.

Course Outcome and Cognitive Level Mapping

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Define the internal and external structures of the body and their physical relationships.	K1
CO2	Understand the structure and organization of tissues, organs, and systems of human body.	K2
CO3	Classify and explain the types of various systems of human body	K2
CO4	Identify and analyze how different systems work together to maintain health and perform various activities.	K3, K4
CO5	Examine the interaction of chemicals with human system that affect functioning of body.	K4

Mapping of CO with PO and PSOs

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	1	2	1	3	1	1	1	1
CO2	1	3	1	1	1	3	1	1	1	1
CO3	1	3	1	2	1	3	2	1	1	1
CO4	2	3	2	1	1	3	2	1	1	1
CO5	2	3	3	2	1	3	2	1	1	1

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,
“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

**DISCIPLINE SPECIFIC ELECTIVE
HUMAN ANATOMY AND PHYSIOLOGY**

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to anatomy and physiology: Levels of structural organization and body systems. General principles of cell communication, intracellular signalling - Contact-dependent, Paracrine, Synaptic & Endocrine. Classification of tissues, structure, location and functions of epithelial, muscular and nervous and connective tissues.	12	CO1, CO2	K1, K2, K3, K4
II	Integumentary & Respiratory System : Structure and functions of skin. Receptors: touch, pressure, nociceptors, chemoreceptors, mechanoreceptors. Anatomy of respiratory system with special reference to anatomy of lungs, mechanism of respiration, regulation of respiration.	15	CO2, CO3	K1, K2, K3, K4
III	Nervous & Cardiovascular system : Classification of peripheral nervous system: Structure and functions of sympathetic and parasympathetic nervous system. Origin and functions of spinal and cranial nerves. Heart – anatomy of heart, blood vessels. Structure and functions of artery, vein and capillaries, elements of conduction system of heart and its regulation by autonomic nervous system.	17	CO3, CO4	K1, K2, K3, K4
IV	Endocrine, Skeletal & Muscular System : Classification of hormones, mechanism of hormone action, structure and functions of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal gland, thymus. Skeletal system - types of bone, salient features and functions. Organization of skeletal muscle. Structure, Types and function of muscles. physiology of muscle contraction, neuromuscular junction.	18	CO4, CO5	K1, K2, K3, K4
V	Reproductive & Urinary system : Anatomy of male and female reproductive system, Functions of male and female reproductive system. Anatomy of urinary tract with special reference to anatomy of kidney and nephrons, functions of kidney and urinary tract.	13	CO3, CO5	K1, K2, K3, K4

VI	Self-Study for Enrichment (Not Included for End Semester Examination) Cell junctions - Occluding junction, Adhering junction, Desmosome & Gap junction.	-	CO1, CO2	K1, K2, K3, K4

Text Books

1. Shaeena, M.H. & Dr. Baharul Islam, H. (2023). *Textbook of Human Anatomy And Physiology*. Pritam Publications.
2. Murugesh, N. (2021). *Human Anatomy And Physiology*. 1st Edition. Sathya Publishers.
3. Venkatesh, D. & Sudhakar H.H. (2020). *Textbook of Medical Physiology*. 3rd Edition. Wolters Kluwer (India) Pvt. Ltd
4. Yalayswamy, N.N. (2020). *Human anatomy and physiology for courses in nursing and allied health sciences*. 4th Edition. CBS Publishers & Distributors Pvt. Ltd.
5. John, E.H. & Michael, E.H. (2020). *Guyton and Hall Textbook of Medical Physiology*, 14th Edition. Elsevier Publisher.

Reference Books

1. Krishna, A.P. (2021). *Fundamentals of Medical Physiology*. 1st Edition. IP Innovative Publication Pvt. Ltd.
2. Bhise, S.B. & Yadav, A. V. (2021). *Human Anatomy and Physiology*. Nirali Prakashan Publisher.
3. Chaudhary, S. & Chaudhary, A. (2021). *Human Anatomy and Physiology*. S Vikas and Company.
4. Comstock, J.L. (2022). *Outlines of Physiology, Both Comparative And Human*. Legare Street Press.
5. Vishram, S. (2020). *Textbook of Clinical Neuroanatomy*. 4th Edition. Elsevier Health Science Publisher.

E Books

1. <https://www.pdfdrive.com/principles-of-anatomy-and-physiology-with-a-brief-atlas-of-the-skeleton-surface-anatomy-e184863666.html>
2. <https://www.pdfdrive.com/essentials-of-anatomy-and-physiology-e25774384.html>
3. <https://www.pdfdrive.com/fundamentals-of-anatomy-and-physiology-for-nursing-and-healthcare-students-e176005292.html>
4. <https://www.pdfdrive.com/basic-clinical-pharmacology-e34443843.html>
5. <https://www.pdfdrive.com/essentials-of-medical-pharmacology-6th-edition-e33763519.html>

Web Links

1. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=WR+tSjp4YS3g7BIFEffOcw==>
2. <https://openstax.org/books/anatomy-and-physiology-2e/pages/1-1-overview-of-anatomy-and-physiology>
3. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/nursing_students/ln_human_anat_final.pdf
4. <https://medictests.com/units/introduction-to-a-p>
5. <https://explorehealthcareers.org/field/pharmacology/>

Pedagogy

Lecture, Power point presentation, Seminar, Assignment, Quiz, Group Discussion, Video/Animation

Course Designer

Ms P. JENIFER

Semester – V	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UBT5DSE1C	PHARMACOGNOSY	Discipline Specific Elective – I (DSE)	5	4

Course Objectives

- To know the fundamentals of Pharmacognosy like scope, classification of crude drugs, their identification and evaluation.
- To study phytochemicals present in the medicinal plants and its properties.
- To know the techniques in the cultivation and production of crude drugs
- To analyse the crude drugs, their uses and chemical nature
- To evaluate the techniques for the herbal drugs.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Recall and infer the basic concepts for understanding of importance of drugs in the treatment of diseases.	K1, K2
CO2	Illustrate the physical, chemical and medical characters of crude drugs of plant and mineral origin.	K2
CO3	Design the drug preparation method and explain the characteristic features of various drug compounds.	K3, K4
CO4	Classify the drugs and explain the role, method of extraction and its applications.	K4, K5
CO5	Elaborate the effects of drugs in allopathy with traditional systems of Medicine.	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	2	1	1
CO2	3	3	2	3	1	3	3	2	2	1
CO3	3	3	2	2	2	3	2	3	3	2
CO4	3	3	3	2	2	2	2	2	2	2
CO5	3	3	3	2	3	3	3	2	3	2

“1” – Slight (Low) Correlation,

“2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

DISCIPLINE SPECIFIC ELECTIVE – I
PHARMACOGNOSY

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to Pharmacognosy Definition, #History and Scope of Pharmacognosy Sources of drugs: Biological, marine, mineral and plants, Classification of drugs: Alphabetical, morphological, taxonomical, chemical and pharmacological basis, Quality control of crude drugs: Adulteration of curde drugs and their detection by organoleptic, microscopic, physical, chemical and biological methods, significance of pharmacopoeial standards.	12	CO1, CO2	K1, K2, K3, K4, K5, K6
II	Phytochemical screening of Drugs Phytochemicals: Preparation of extracts, Screening of alkaloids, saponins, cardenolides and bufadienolides, flavonoids and leucoanthocyanidins, tannins and polyphenols, anthraquinones, cynogenetic glycosides, amino acids in plant extracts. Pharmaceutical aids: Study of pharmaceutical aids like talc, diatomite, kaolin, bentonite, gelatin and natural colors.	11	CO1, CO2, CO3	K1, K2, K3, K4, K5, K6
III	Sources of Natural drugs Study of the biological sources, cultivation, collection, commercial varieties, chemical constituents, substitutes, adulterants, uses, and specific chemical tests of following groups of drugs containing glycosides: Saponins: ginseng, Dioscorea; Cardioactive sterols: Digitalis; Anthraquinone cathartics: Senna Others: saffron.	13	CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Modern pharmacognosy The development of modern pharmacognosy in organic chemistry -structure prediction using analytic chemistry techniques, including paper, HPTLC and Gas chromatography Mass spectrophotometry for pharmacologically bio-synthesized substances from the plants - Quinine, Nicotine and Vinca alkaloids-vincristine.	11	CO3, CO4	K1, K2, K3, K4, K5, K6
V	Uses of Secondary Metabolites Pharmaceutical applications of secondary metabolites like Alkaloids: Rauwolfia; Flavonoids: Lignans, Tea; Triterpenoids: Dioscorea. Volatile oils: Mentha; Tannins: Catechu; Resins: Asafoetida; Glycosides: Bitter Almond.	13	CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	Self - Study for Enrichment (Not included for End Semester Examination) Indigenous system of medicine, Fibers used in pharmacy, Drug administration, Extraction methods, Drugs of Marine source.	-	CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Veronika Butterweck and Robert furst. (2020). *Planta Medica Journal of Medicinal Plant and Natural Product Research*. Thieme.de publishers.
2. Pathania JS. (2020). *Text Book of Pharmacology for Paramedical students*. CBS Publishers and Distributors
3. Dr.Kuntal Das. (2019). *Pharmacognosy and Phytochemistry -II*. Nirali Publishers
4. Tripathy K. D, (2018). *Essentials of Medical Pharmacology (6th edition)*, Jaypee publishers
5. Satoskar R.S, Nirmala N. Rege, and Bhandarkar S. D, (2017). *Pharmacology and Pharmacotherapeutics (Revised 23rd Edition)*, Popular Prakashan, Mumbai.

Reference Books

1. J. S. Qadry. (2018). *Pharmacognosy*. CBS Publishers and Distributors
2. Simone Badal McCreath and Rupika Delgoda. (2016). *Pharmacognosy: Fundamentals, Applications and Strategies* Academic Press.
3. M. A. Iyengar and S.G.K. Nayak. (2018). *Pharmacognosy Lab Manual* Pharma Med press.
4. M.S. Krishnamurthy and JV Hebbar. (2018). *Easy Ayurveda Home Remedies: Based On Authentic, Traditional Ayurveda Practice*. Hand Cover
5. Dr.Kuntal Das (2019). *Pharmacognosy and Phytochemistry –II*. Nirali Publishers.

E-Books

1. <https://libguides.tulane.edu/pharmacology/ebooks>
2. <https://www.pharmaresearchlibrary.com/wp-content/uploads/2013/03/A-Textbook-of-Clinical-Pharmacology-and-Therapeutics-5th-edition.pdf>
3. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/pharmacology.pdf
4. <https://medicostimes.com/kd-tripathi-pharmacology/>
5. <https://core.ac.uk/download/pdf/200104466.pdf>

Web Links

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5178364/>
2. https://www.patentdocs.org/biotech_news/
3. <https://www.pharmamanufacturing.com/>
4. <https://www.parexel.com/>
5. <https://nptel.ac.in/courses/102/103/102103013/>

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment, Animations

Course Designer

Dr. M. KEERTHIGA

Semester – V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UBT5SEC2P	MEDICAL LAB TECHNOLOGY - II (P)	SKILL ENHANCEMENT COURSE – II	2	2

Course Objectives

- To learn and execute various techniques in medical lab techniques.
- To perform hands on training on various immunotechniques, clinical biochemical parameters of body fluids.
- To study serological parameters for normal and abnormal persons.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate the basic principles of important techniques in clinical pathology	K1
CO2	Analyze and determine the glucose, urea, uric acid in body fluid	K2
CO3	Perform basic diagnosis tests for infectious agents	K2
CO4	Apply the knowledge on serological parameters for normal and abnormal persons.	K3
CO5	Identify and analyze body fluids and excretory products	K3

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1	3	3	2	3	1
CO2	3	3	3	2	1	3	2	2	3	1
CO3	3	3	2	2	1	3	2	2	2	2
CO4	3	3	3	3	1	3	2	2	3	1
CO5	3	3	2	3	1	3	2	2	2	1

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

SKILL ENHANCEMENT COURSE – II

MEDICAL LAB TECHNOLOGY - II (P)

1. Qualitative analysis - Identification of Carbohydrates of biochemical importance in biological fluid.
2. Qualitative analysis - Identification of Proteins of biochemical importance in biological fluid.
3. Urine analysis – normal & abnormal constituents of urine.
4. Estimation of Glucose in Urine and Blood.
5. Estimation of serum bilirubin.
6. Estimation of serum calcium.
7. Estimation of Total cholesterol in blood.
8. Culture analysis of Urine and blood
9. Microscopic examination of urine for crystals
10. Demonstration of VDRL Test*
11. Demonstration of CRP Test*

* Practical by demonstration only

Reference Books

1. Nanda Maheshwari. (2022). *Clinical Microbiology & Parasitology for DMLT Students*. Fourth edition, Jaypee Brothers Medical Publishers;
2. Henry Harvin. (2021). *Medical Laboratory Technician Handbook*. Henry Harvin Education.
3. Sainani G. S., Rajesh G Sainani. (2018). *A Manual of Clinical and Practical Medicine*. Second Edition. Jaypee Publishers, Chennai.
4. Krishna Das.KV.(2013). *Clinical Medicine, A Text Book of Clinical Methods and Laboratory Investigations*. Jaypee publishers, Chennai.
5. Baker.F.J, Selverton.R.E. (2012). *Introduction To Medical Laboratory Technology*. Seventh Edition. Elsevier, USA.

E books

1. <https://www.pdfdrive.com/a-manual-of-laboratory-and-diagnostic-tests-e157742334.html>
2. <https://www.pdfdrive.com/lippincott-manual-of-nursing-practice-e189815788.html>
3. <https://www.pdfdrive.com/introduction-to-genetic-analysis-solutions-megamanual-e158762003.html>
4. <https://www.jaypeedigital.com/book/9789350908518>
5. <https://bookpdf.co.in/vmc-lab-technician-notes-2021-download-vmc-lab-technician-study-materials/>

Web links:

1. <https://egyankosh.ac.in/bitstream/123456789/16314/1/Experiment-8.pdf>
2. [https://uou.ac.in/sites/default/files/slm/MSCBOT-510\(L\).pdf](https://uou.ac.in/sites/default/files/slm/MSCBOT-510(L).pdf)
3. <https://vlab.amrita.edu/?sub=3&brch=76&sim=1089&cnt=1>
4. https://webstor.srmist.edu.in/web_assets/srm_mainsite/files/files/BT0213%20-%20CELL%20BIOLOGY%20PRACTICAL%20MANUAL.pdf
5. https://www.iitg.ac.in/cseweb/vlab/anthropology/procedure_mendels.html

Pedagogy

Practical Observation, Video and Demo

Course Designers

Dr. M. KEERTHIGA

Semester – II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
23UCH2AC3B	BIOLOGY - II	ALLIED	4	3

Course Objectives

- To gain knowledge about the bacterial and viral structure and diseases
- To understand the structure and function of various cell organelles.
- To acquire knowledge on sex linked inheritance in man.
- To understand the basic concepts of molecular biology.
- To study the biotech applications.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Recall and infer the factual and conceptual information required for understanding of microbiology, cell biology, genetics and biotechnology.	K1, K2
CO2	Illustrate basic concepts of various branches of applied biology for sustainable development of mankind.	K2
CO3	Develop and compare the structure and function of cells and explain the development of various cells.	K3, K4
CO4	Classify the beneficial and harmful effects of organisms and explain the role of organisms in various field of human welfare.	K4, K5
CO5	Elaborate the core concepts and fundamentals of genetic engineering for the human welfare.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	2	2	1
CO2	3	3	2	3	2	3	2	2	2	1
CO3	3	3	2	2	2	3	2	2	2	2
CO4	3	3	3	2	2	2	2	2	2	2
CO5	3	3	3	2	3	1	3	2	3	2

“1” – Slight (Low) Correlation,
“3” – Substantial (High) Correlation,

“2” – Moderate (Medium) Correlation,
“-” indicates there is no correlation.

**ALLIED
BIOLOGY - II**

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Microbiology: General structure of prokaryotic cell (E. Coli), Morphology of Bacteria: Coccus type: - Micrococcus and Staphylococcus, Bacillus type: - Micro bacillus and Streptobacillus, Spirochetes, and Comma shaped. Bacterial and Viral disease: Pathogenesis, Symptoms, Prevention, and Control - Gonorrhea and AIDS.	12	CO1, CO2, CO4	K1, K2, K3, K4, K5, K6
II	Cell Biology: Structure and functions of the following cell components: Cell membrane, Cell organelles - ultra structure and function of chloroplast, mitochondria and nucleus. Cell division - mitosis and meiosis.	11	CO1, CO2, CO3	K1, K2, K3, K4, K5, K6
III	Genetics: Mendelism - Law of dominance, Law of segregation, Incomplete dominance. Law of independent assortment. Monohybrid and dihybrid cross - Test cross - Back cross.	13	CO3, CO5	K1, K2, K3, K4, K5, K6
IV	Molecular biology Structure and functions of DNA, Structure and functions of RNAs (t RNA, m RNA, and r RNA), DNA replication and Protein synthesis.	11	CO2, CO5	K1, K2, K3, K4, K5, K6
V	Biotechnology Recombinant DNA -Construction and applications, Stem Cell Culture-Methods and applications, Transgenic animals-Methods and applications and DNA finger printing-Methods and applications	13	CO2, CO3, CO5	K1, K2, K3, K4, K5, K6
VI	Self - Study for Enrichment (Not included for End Semester Examination) Viral disease: COVID, Ultra structure of cell wall, <i>in vitro</i> animal cell culture, DNA as genetic material, Genetically modified organism.	-	CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Benjamin A.P. 2020. *Genetics: A Conceptual Approach*. 7th Edition, WH Freeman publisher,
2. Verma, P.S & Agarwal, V.K. (2022). *Cell Biology, Genetics, Molecular Biology, Evolution and Ecology*. S Chand and Company Ltd.
3. Vishnu Shankar, S. (2021). *Fundamentals of Genetics and Molecular Biology*. Red'shine Publication Pvt. Ltd.
4. Pragma, K. (2020). *Essentials of Genetics*. Dream tech Press.
5. Rao, K., Krishnamurthy, K.V and Rao, G.S. (1979). *Ancillary Botany*. S. Viswanathan Pvt. Ltd., Madras.

Reference Books

1. Poonam, A. (2022). *Lippincott Illustrated Reviews: Cell and Molecular Biology*. Wolters Kluwer India Pvt Ltd.
2. Harvey, L., Arnold B., Chris, A. K & Monty, K. (2021). *Molecular Cell Biology* Ninth edition. W. H. Freeman
3. Nancy, L.C., Rachel, R.G., Carol, C.G., Gisela, G.S & Cynthia, W. (2020). *Molecular Biology: Principles of Genome Function* 3rd Edition. Oxford University Press.
4. Lieberman. (2020). *BRS Biochemistry, Molecular Biology, and Genetics*. 7th edition. Wolters Kluwer India Pvt Ltd.
5. Jocelyn, E.K., Elliott, S.G & Stephen, T.K. (2017). *Lewin's GENES XII* 12th edition. Jones and Bartlett Publishers, Inc

E-Books

1. <https://www.pdfdrive.com/lewins-genes-xii-e185848559.html>
2. <https://www.pdfdrive.com/introduction-to-genetics-a-molecular-approach-e187102063.html>
3. <https://www.pdfdrive.com/the-cell-a-molecular-approach-e186369576.html>
4. <https://www.pdfdrive.com/genetics-a-conceptual-approach-e186741220.html>
5. <https://www.pdfdrive.com/cell-biology-genetics-molecular-biology-evolution-and-ecology157248372.htm>

Web Links

1. <https://microbenotes.com/category/molecular-biology/>
2. <https://www.easybiologyclass.com/topic-genetics/>
3. <https://ocw.mit.edu/courses/7-03-genetics-fall-2004/pages/lecture-notes/>
4. <http://ndl.iitkgp.ac.in/document/bnZnR2hPaUVqRU9TbFc2Rmp1MVJzN0dyTCs3OGxyRzdaUWpPTzdRV2pBTT0>
5. <http://ndl.iitkgp.ac.in/document/Qkh4R2FGUkRNZjFicFUvWmpzQ2loU1NPaEl6eWpVaXpnNGUwc2liQzZKbUdaczdobHlyeWNpditXM2hpaFNOS1F6dVc4NGltYWZEQ09YbEVlWjJtelE9PQ>

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment, Animations

Course Designer

Dr. M. KEERTHIGA

ANNEXURE O

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (IICYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS



B.Sc., NUTRITION AND DIETETICS

SYLLABUS

2023-2024 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18



DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS

B.Sc., NUTRITION AND DIETETICS

LEARNING OUTCOME BASED CURRICULUM FRAME WORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2023-2024 onwards)

Semester I

Semester	Part	Course	Title	Course Code	Inst .Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course – I (LC) – Tamil * / Other Languages *	Podhu Tamil -1	23ULT1	6	3	3	25	75	100
			Hindi ka Samanya Gyan aur Nibandh	23ULH1						
			Poetry, Grammar and History of Sanskrit Literature	23ULS1						
			Foundation Course: Paper I- French I	23ULF1						
	II	English Language Course-I (ELC)	General English– I	23UE1	6	3	3	25	75	100
	III	Core Course –I (CC)	Human Physiology	23UND1CC1	5	5	3	25	75	100
		Core Practical-I (CP)	Human Physiology (P)	23UND1CC1P	3	3	3	40	60	100
		First Allied Course –I (AC)	Food Chemistry	23UND1AC1	4	3	3	25	75	100
		First Allied Course –II (AP)	Food Chemistry (P)	23UND1AC2P	4	3	3	40	60	100
	IV	Ability Enhancement Compulsory Course– I (AECC)	Value Education	23UGVE	2	2	-	100	-	100
		TOTAL			30	22				700

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23UND1CC1	HUMAN PHYSIOLOGY	CORE	5	5

Course Objectives

- To augment knowledge on anatomical perception of organs and its co-ordination with other organs.
- To understand the functions of the human organs.
- To study the structure of human organs.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Define the main structures composing human body	K1
CO 2	Explain process of the system in the body	K2
CO 3	Relate organ structure with function	K3
CO 4	Determine functions of cells, tissues and organs	K4
CO 5	Ascertain physiological adaptations	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	3	2
CO2	3	3	3	2	3	3	3	2	3	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	2	3	3	3	2	3	2
CO5	3	3	3	2	3	3	3	2	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	a. Cell : Structure of organelles and functions. Tissues– Structure, classification and functions. b. Blood : Composition, functions, coagulation, factors affecting coagulation, blood groups. c. Immune system : Innate, acquired and active immunity, cell mediated immunity, humoral immunity and complement system	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4
II	a. Heart and Circulatory system: Structure, cardiac cycle, cardiac output, factors affecting cardiac output, normal ECG, heart failure, blood pressure, control and factors affecting blood pressure. b. Respiratory system : Structure and functions, Lung volumes and lung capacities, Factors affecting efficacy of respiration.	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4
III	a. Nervous System: General classification of nervous system-, Structural organization of nervous system – neuron, ganglion, neuroglia, nerves – classification - motor, sensory and mixed, Structure and functions - spinal cord, brain - anatomy and functions of cerebrum, cerebellum, brain stem and medulla oblongata. b. Sense Organs : Structure and function of eye, ear, nose and tongue.	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4
IV	a Gastrointestinal and Hepato biliary system : Digestive system- Anatomy, Structure and Functions of mouth, pharynx, esophagus, stomach, Small intestine and large intestine. Digestive gland – salivary, liver, gall bladder and pancreas. Digestion in the mouth, stomach and intestines. b. Excretory system : Urinary System-Structure and functions of organs of urinary system, Mechanism of urine formation. micturition	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4

	Skin- Structure and functions, Regulation of body temperature.			
V	a. Endocrine system : Thyroid, Parathyroid, Adrenal gland, Pituitary and Sex glands – Structure and functions b. Reproductive system : Female reproductive system--Structure and functions, menstrual cycle, menarche and menopause. Male Reproductive system - Structure and functions.	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Functions of hemoglobin, Artificial respiration, Errors of refraction, Movements of the intestine Menstrual disorders.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Sembulingam. (2016). *Essentials of Medical Physiology*. Health Sciences Publisher. New Delhi.
2. Subramanyam., Sarada. (2018). *Textbook of Human Physiology*. S.Chand and company Ltd, New Delhi.
3. Randhawa.S.S., Atul Kabra.(2017). *Human Anatomy and Physiology-I*. S.Vikas and Company, India.

Reference Books

1. Guyton (2000). Guyton and Hal *Textbook of Medical Physiology*, Saunders, United States of America.
2. Waugh Anne Ross and Wilson (2003). *Anatomy and Physiology in Health and Illness*. Churchill Livingstone. New York.
3. Muruges. N (2011). *Anatomy and Physiology*, Sathya Publishers, Madurai.
4. Wilson Ross (2014). *Anatomy and Physiology in Health and Illness*, Reed Elsevier India Private Limited. New Delhi.
5. Chatterjee .C.(2016). *Human Physiology Volume I*, Medical Allied Agency. Kolkata.

Web Link:

1. <https://www.khanacademy.org/science/health-and-medicine/human-anatomy- andphysiology>
2. <https://www.biologyonline.com/tutorials/the-human-physiology>
3. <https://digitaleditions.library.dal.ca/intropsychneuro/chapter/hunger-and-eating/>
4. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkB A==>

Journals:

1. Human Physiology, Maik Nauka / Interperiodica Publishing, Russian Federation.
2. Indian Journal of Clinical Anatomy and Physiology, Innovative publication Pvt. LTD, India.
3. American Journal of Physiology - Endocrinology and Metabolism, American Physiological Society, United States.
4. Canadian Journal of Physiology and Pharmacology, Canadian Science Publishing, Nrc Research Press, Canada.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designers

- Ms. S.FATHIMA

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23UND1CC1P	HUMAN PHYSIOLOGY (P)	CORE PRACTICAL	3	3

Course Objectives

- To acquire knowledge on cellular arrangements
- To understand the components present in blood
- To learn methods to be adopted for the measurement of various blood parameters

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Identify cells present in the body	K1
CO 2	Explain cellular adaptations related to physiological changes	K2
CO 3	Illustrate the methods to be adapted for the measurement of various blood parameters	K2
CO 4	Predict number of cells present in blood	K3
CO 5	Dissect various cellular arrangement in tissues and organs	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	3	2
CO2	3	3	3	2	3	3	3	2	3	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	2	3	3	3	2	3	2
CO5	3	3	3	2	3	3	3	2	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

List of Experiments

1. Microscopic study of tissues- epithelial, connective and muscular.
2. Collection of blood sample-Capillary blood from finger tips and venous blood.
3. Separation of blood components (Centrifugation).
4. Estimation of hemoglobin-Sahli's Acid hematin method.
5. Determination of Hematocrit (Wintrobe method).
6. Preparation and examination of stained blood smear (Wedge or glass slide method).
7. Determination of Erythrocyte Sedimentation Rate (Wintrobe method).
8. Determination of blood group.
9. Determination of bleeding time (Duke method) and coagulation time (Capillary tube method).
10. Platelet count (Rees Ecker method by hemocytometry).
11. Clinical examination of radial pulse (pulse rate).
12. Measurement of blood pressure (Sphygmomanometry).
13. Effect of exercise on blood pressure and heart rate.
14. Microscopic structure of heart, digestive system and kidney.
15. Microscopic structure of reproductive organs-ovary, uterus, mammary glands and testis.
16. Microscopic structure of endocrine glands-thyroid, pituitary and adrenal.

Text Books

1. G.K.Pal and Parvati Pal.(2001) *Text book of practical physiology*. Orient Longman Ltd.

Reference Books

- 1.Sembulingam. (2016). *Essentials of Medical Physiology*. Health Sciences Publisher. New Delhi.
2. Subramanyam., Sarada. (2018). *Textbook of Human Physiology*. S.Chand and Company Ltd, New Delhi

Web Links:

1. <https://www.khanacademy.org/science/health-and-medicine/human-anatomy-andphysiology>
2. <https://www.biologyonline.com/tutorials/the-human-physiology>
3. <https://digitaleditions.library.dal.ca/intropsychneuro/chapter/hunger-and-eating/>
4. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkB A==>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demonstration

Course Designers

- MS. S.FATHIMA

SEMESTER I	INTERNAL MARKS:25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23UND1AC1	FOOD CHEMISTRY	ALLIED	4	3

Course Objectives

- To gain insight into the chemistry of foods
- To understand the scientific principles involved in food preparation
- To understand the various properties exhibited by foods

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the Successful completion of the course, students will be able to	
CO1	Define physical and chemical properties of food	K1
CO2	Explain the structural changes of food during cooking	K2
CO3	Predict the cooking quality of food	K3
CO4	Classify plant pigments	K3
CO5	Examine the uses of food additives and leavening agent	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	1	1	3	3	1	1	1
CO2	3	2	2	1	1	3	2	1	1	1
CO3	3	3	2	2	1	3	3	1	1	1
CO4	3	3	2	2	1	3	3	1	2	1
CO5	3	2	1	-	-	3	3	2	1	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Food Science, Physiochemical properties of food and water a) Introduction to Food Science – Definition of Food Science, Basic Five Food Groups and its components, Nutritional classification of food. b) Introduction to physiochemical properties of food - Physical Properties of water and ice, hydrogen bonding, bound water, water activity, determination of moisture content. c) Types of colloidal system - Colloids, sol, gel, emulsion and foam.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Starch and Sugar a) Starch- Structure, characteristics, components and types, swelling of starch granules, gel formation, gelatinization, retrogradation, effect of sugar, acid, alkali, fat and surface-active agents on starch. b) Sugar - Stages of sugar, artificial sweeteners, solubility and crystallization, factors affecting crystallisation – crystalline and non-Crystalline candies, caramelization, chemistry of milk sugar, non-enzymatic browning and its preventive measures.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Protein a) Properties and components of protein - Coagulation and denaturation of protein, protein concentrates, isolates and hydrolysate and their application, effect of soaking, fermentation and germination on pulse protein. b) Chemistry of protein-Action of heat, acid, and alkali on vegetable and animal protein.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Fats and oils a) Physical and chemical properties of fats and oils - Hydrogenation, winterization, decomposition of triglycerides, shortening power of fats. b) Changes in fats and oils–Changes during cooking, factors affecting absorption of fat in foods.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

V	Pigments, Food additives and Leavening agents a) Pigments - Types of plant pigments, water and fat soluble pigments, natural colours used in foods, pectins, phenolic components, enzymatic browning in fruits and vegetables. volatile compounds in fruits and vegetables. b) Food additives -Classification and its uses. c) Leavening agents - Types, physical, chemical and biological leavening agents, mechanism of action.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Types of emulsion, Factors affecting gelatinization, Chemistry of coagulation of egg, Types and prevention of rancidity, Uses of Leavening agents.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Shakuntala Manay. N. (2013). *Foods: Facts and Principles*. (3rd ed.). New Age International Publishers, New Delhi.
2. Swaminathan, M. (2019). *Advanced Text Book on Food and Nutrition*. (2nd ed.). Bangalore Printing and Publishing Co. Ltd, Bangalore.
3. Srilakshmi.B.(2020). *Food Science*. (8th ed). New Age International Publishers, New Delhi.
4. Iqbal, Syed Aftab. (2011). *Advanced Food Chemistry*. Discovery Publishing House, New Delhi.
5. Chopra H,K and Panesar P,S. (2015). *Food Chemistry*. Narosa Publishing House(P) Ltd, New Delhi.

Reference Books

1. Vickie, A., Vaclavik Elizabeth, W.Christian. (2014). *Essentials of Food Science*.(4th ed.). Springer Science and Business Media, New York.
2. Raheena Begum, M. (2015). *Textbook of Foods. Nutrition and Dietetics*. (3rd ed.), Sterling Publishers Pvt. Ltd, New Delhi.
3. Avantina Sharm. (2019). *Textbook of Food Science and Technology*. (3rd ed.). CBS Publishers and Distributors.

Web Links

- <https://www.sciencedirect.com/journal/food->
- <https://www.eolss.net/sample-chapters/c10/e5-08-07-00.pdf>
- <http://egyankosh.ac.in/handle/123456789/69055>

Journals

1. Journal of food chemistry and nutrition science, Pakistan.
2. Food chemistry, Elsevier, United Kingdom.

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Group Discussion

Course Designer

Ms.N.GANGA DEVI

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (IICYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS



B.Sc., NUTRITION AND DIETETICS

SYLLABUS

2023-2024 and Onwards



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS
B.Sc., NUTRITION AND DIETETICS
LEARNING OUTCOME BASED CURRICULUM FRAME WORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2023-2024 onwards)
Semester II

Semester	Part	Course	Title	Course Code	Inst.Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
II	I	Language Course – II (LC) – Tamil * / Other Languages *	Podu Tamil - II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar - II	22ULH2						
			Pros, Grammar and History of Sanskrit literature	23ULS1						
			Basic French - II	22ULF2						
	II	English Language Course-II (ELC)	General English - II	23UE2	6	3	3	25	75	100
	III	Core Course –II (CC)	Nutrition Through Life Span	22UND2CC2	5	5	3	25	75	100
		Core Practical-II (CP)	Nutrition Through Life Span (P)	22UND2CC2P	3	3	3	40	60	100
		Core Course –III (CC)	Food Science	23UND2CC3	2	2	3	25	75	100
		First Allied Course – III (AC)	Macro and Micro Nutrients	23UND2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course– II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Ability Enhancement Compulsory Course– III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
		Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation					
		TOTAL			30	22				800

SEMESTER - II	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23UND2CC3	FOOD SCIENCE	CORE	2	2

Course Objectives

- To obtain knowledge on different food groups and their composition
- To study the different methods of cooking
- To understand the role of food groups in cookery

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Identify foods based on food groups and list their uses.	K1
CO 2	Explain classification, nutritive value and storage of different food groups	K2
CO 3	Relate changes in food due to cooking, processing and factors that affect acceptability, and nutritive value of various food groups	K3
CO 4	Sketch different methods of cooking and select the methods best suited for cooking different foods.	K3
CO 5	Ascertain the selection criteria of different food groups	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	-	2	2	3	3	3	2	-
CO2	3	3	-	2	2	3	3	3	2	-
CO3	3	3	-	2	2	3	3	3	2	-
CO4	3	3	-	2	2	3	3	3	2	-
CO5	3	3	-	2	2	3	3	3	2	-

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	a) Fundamentals Food Science Definition of food science, basic five food groups, nutritional classification of foods–energy yielding, body building, protective and regulatory foods. b) Cooking methods Objectives, different types cooking methods-moist, dry heat methods, microwave cooking, combination of cooking methods. Recent methods of cooking–Ohmic cooking and induction cooking –merits and demerits.	6	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4
II	a) Cereals and Millets Classification of cereals, structure, composition, nutritive value of cereals, milling of parboiling of rice. Nutritional importance of millets-(maize, jowar, ragi, bajra), malting of cereals and role of cereals in cookery. b) Pulses Composition, nutritive value, factors affecting cooking quality of pulses, germination, role of pulses in cookery.	6	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4
III	a) Vegetables Classification and nutritive value, pigments-fat-soluble, water-soluble, selection of vegetables, cooking of vegetables-changes during cooking. b) Fruits Classification, nutritive value, changes during ripening of fruits, enzymatic browning and methods of prevention.	6	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4
IV	a) Milk and Milk Products Composition, nutritive value, types of milk products-fermented milk products (Buttermilk, Yogurt) and non-fermented milk products (Skim milk, evaporated milk, sweetened condensed milk, Milk powder, Khoa, Ice cream, Pasteurization, and homogenization. b) Egg, Meat, Poultry and Fish Structure, classification, composition, nutritive value, selection, post mortem changes in meat, and tenderness of meat, cooking and storage.	6	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4

V	a) Fats, Sugar, Spices and Condiments Types, sources-animal fats and vegetable fats, functions, rancidity, smoking point and role of fat or oil in cookery. b) Sugar Types and market forms of sugars, sugar related products, uses in cookery. c) Salt-Types and Uses d) Spices and Condiments Classification, uses of spices in Indian cookery and medicinal properties.	6	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Solar cooking method- merits and demerits. Role of millets in cookery. Criteria of selection of fruits. Role of milk in cookery. Stages of sugar cookery.	-	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4

Text Books

1. Potter, Norman. N. (2007). *Food Science*. (5thed). CBS Publications and distributors. New Delhi.
2. Shakuntala Manay. N. (2013). *Foods: Facts and Principles*. (3rded). New Age International Publishers. New Delhi.
3. Swaminathan, M. (2019). *Advanced Text Book on Food and Nutrition*. Volume (2nded). Bangalore Printing and Publishing Co. Ltd, Bangalore.
4. Mahatb, S. Bamji. Kamala Krishnasamy. Brahman. G.N.V.(2020). *Textbook of Human Nutrition*. (3rded.). Oxford and IBH Publishing Co. P. Ltd., New Delhi.

Reference Books

1. Sharma Jyoti, S. (2009). *Applied Nutrition and Food Science*. Akansha Publishing House, New Delhi.
2. Raheena Begum, M. (2015). *Textbook of Foods, Nutrition and Dietetics*. (3rded.). Sterling Publishers Pvt. Ltd, New Delhi.
3. Krause, M. V. Hunesher, M. A. (2013). *Food, Nutrition and Diet Therapy*. W. B. Saunders Company. Philadelphia. London.
4. Vickie, A. Vaclavik Elizabeth, W. Christian. (2014). *Essentials of Food Science*. (4thed.). Springer Science and Business Media, New York.
5. Avantina Sharma. (2019). *Textbook of Food Science and Technology*. (3rded.). CBS Publishers and Distributors.

Web Links:

- <https://www.scienceofcooking.com/>
- https://www.brainkart.com/article/Structure-of-cereal-grains_33949/
- <https://fruitsandveggies.org/stories/key-nutrients-that-protect/>
- <https://pubmed.ncbi.nlm.nih.gov>
- <https://journalofethnicfoods.biomedcentral.com>

Journals

1. Food Science and Nutrition, John Wiley and Sons Ltd publisher, United Kingdom.
2. Food and Nutrition Research, Co-Action Publishing, Sweden.
3. Journal of Food Science Education, Institute of Food Technologists publishing, United States.
4. Journal of the Science of Food and Agriculture, Wiley-Blackwell publishing, England.

Pedagogy:

Chalk and talk, Power Point Presentation, Discussion, Assignment, Quiz, Seminar.

Course Designers:

MS. E. AGALYA

MS. C. NIVETHA

SEMESTER – II	INTERNAL MARKS – 25		EXTERNAL MARKS - 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDIT
23UND2AC3	MACRO AND MICRO NUTRIENTS	ALLIED	4	3

Course Objectives

- To gain knowledge on classification of nutrients.
- To get insight into the role of nutrients in maintaining health of the individual and community.
- To understand the inter-relationship of the various nutrients.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify food sources of macro and micro nutrients	K1
CO2	Illustrate functions of macro and micro nutrients	K2
CO3	Relate inter– relationship between health and nutrition	K3
CO4	Predict excess and deficiency effects of various nutrients	K3
CO5	Determine water and electrolyte balance	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1	3	3	1	3	-
CO2	3	3	2	2	1	3	3	1	3	-
CO3	3	3	2	2	1	3	3	1	3	-
CO4	3	3	2	2	1	3	3	1	3	-
CO5	3	3	2	2	1	3	3	1	3	-

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	a) Carbohydrates – Nutritional classification, functions, sources, deficiency and excess effects. Dietary Fibre – definition, Classification. physiological and metabolic effect, role of fibre in prevention of diseases. b) Energy – Units of measurement, determination of energy value of food, components of energy requirement, measurement of total energy requirements. Energy requirement during work. Specific Dynamic Action. Basal Metabolic Rate and factors affecting BMR	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	a) Proteins –Nutritional classification of proteins and amino acids, functions of proteins and amino acids, sources, deficiency and excess effects. Evaluation of protein quality. (PER, BV, NPU, CS) b) Lipids – Nutritional classification of lipids and fatty acids, Essential fatty acids, functions, deficiency and excess effects, health benefits of omega fatty acids.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	a) Vitamins - Fat Soluble Vitamins- (A, D, E & K) –Functions, RDA, sources, deficiency and excess effects. b) Water Soluble Vitamins - (B complex & C) - Functions, RDA, sources, deficiency and excess effects.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4,

IV	a) Minerals-Macro Minerals- (Calcium, Phosphorus, Potassium, Sodium) - Functions, RDA, sources, deficiency and excess effects. b) Micro Minerals - (Iron, Iodine, Fluorine) - Functions, RDA, sources, deficiency and excess effects.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	a) Water – Definition, distribution of water, functions, requirements, sources, water balance, maintenance of water balance, distribution of electrolytes, maintenance of electrolyte balance. b) Nutrient interrelationship – Interrelationship between macronutrients and vitamins.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Health benefits of dietary fibre. High biological value protein. Toxicity of vitamins. General functions of minerals in human body. Role of water in human body.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Swaminathan, M. (1999). *Handbook of Food and Nutrition*. Bangalore Publishing Co Ltd, Bangalore.
2. Srilakshmi, B. (2017). *Nutrition Science*. New Age International(p)ltd. New Delhi.
3. Longvah, T., Anandhan, R., Bhaskarachary, K. Venkaiah, K. (2017). *Indian Food Composition Table*. National Institute of Nutrition.

Reference books

1. Swaminathan, M. (1998). *Essentials of Food and Nutrition*. Bappco, Bangalore.
2. Vidya, Chintapalli. (1996). *Textbook of Nutrition*. Discovery Book Palace(p) Ltd, Chennai.
3. Berdanier, Carolyn, D. (2015). *Advanced Nutrition: Macronutrients, Micronutrients, and Metabolism*. Atlantic Publishers and Distributors. New Delhi.
4. Raheena Begum, M. (2009). *Textbook of Foods, Nutrition and Dietetics*. Sterling Publishers. New Delhi.
5. Martin Eastwood. (2013). *Principles of Human Nutrition*. Wiley Publishing.
6. Bamji Mahtab, S. (2017). *Textbook of Human Nutrition* (3rd ed.). Oxford & IBH Publishing Co Pvt Ltd. New Delhi.
7. Gopalan, C. (2011). *Dietary Guidelines for Indians*. Second Edition National Institution of Nutrition. Hyderabad.

Web links

- <https://www.publichealthnotes.com/classification-of-nutrients-type-i-type-ii-macro-micro/>
- <https://openoregon.pressbooks.pub/nutritionscience/chapter/1c-classification-of-nutrients/>
- <https://www.medicalnewstoday.com/articles/161547#nutrition>
- https://www.healthline.com/nutrition/protein-deficiency-symptoms#TOC_TITLE_HDR_6
- <https://www.healthline.com/health/mineral-deficiency#What-are-the-symptoms-of-mineral-deficiency>

Journals

1. Italian Journal of Pediatrics, Biomedical Central Ltd, Springer.
2. International Journal of Innovative Research and Reviews Erzurum, Turkey.
3. Journal of Food and Nutritional Disorders, London, United Kingdom

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designers

Ms. E.AGALYA

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (IHCYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS



B.Sc., NUTRITION AND DIETETICS

SYLLABUS

2022-2023 and Onwards



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS
B.Sc., NUTRITION AND DIETETICS
LEARNING OUTCOME BASED CURRICULUM FRAME WORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2022-2023 onwards)
Semester IV

Semester	Part	Course	Title	Course Code	Inst .Hrs. / week	Credits	Exam			Total	
							Hrs.	Marks			
								Int	Ext		
IV	I	Language Course – IV (LC) Tamil * / Other Languages*)	Pandaiya Ilakiyamum Urainadaiyum	22ULT4	6	3	3	25	75	100	
			Hindi Literature & Functional Hindi	22ULH4							
			Drama, History of Drama Literature	22ULS4							
			Intermediate French-II	22ULF4							
	II	English Language Course - IV(ELC)	Learning Grammar Through Literature - II	22UE4	6	3	3	25	75	100	
	III	Core Course – V(CC)	Diet Therapy II	22UND4CC5	6	6	3	25	75	100	
		Core Practical - IV(CP)	Diet Therapy II (P)	22UND4CC4P	4	4	3	40	60	100	
		Second Allied Course – III (AC)	Food Chemistry	22UND4AC6	4	3	3	25	75	100	
		Internship	Internship	22UND4INT	-	2	-	40	60	100	
	IV	Generic Elective Course– II (GEC)	Meal Planning for the Family	22UND4GEC2	2	2	3	25	75	100	
			Basic Tamil - II	22ULC4BT2							
			Special Tamil - II	22ULC4ST2							
		Skill Enhancement Course– I (SEC)	Basics in Food Production (P)	22UND4SEC1P	2	2	3	40	60	100	
		Extra Credit Course	SWAYAM ONLINE COURSE	As per UGC Recommendation							
		TOTAL			30	25				800	

SEMESTER IV	INTERNAL MARKS:25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UND4CC5	DIET THERAPY II	CORE	6	6

Course Objectives

- To learn role of dietary treatment in the management of disease conditions.
- To know the principles of dietary management.
- To know the role of computers in management of dietary practice.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Define the causes, symptoms and complications of diseases.	K1
CO 2	Explain the application of dietary principles in the management of various diseases and compute nutritive value.	K2
CO 3	Interpret the role of nutraceuticals in the prevention of diseases.	K2
CO 4	Apply the steps in diet counselling process	K3
CO 5	Examine the importance of computers in nutrition practice.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	2	3	3	2
CO2	3	3	3	2	3	3	2	3	3	2
CO3	3	3	3	2	3	3	2	3	3	2
CO4	3	3	3	2	3	3	2	3	3	2
CO5	3	3	3	2	3	3	2	3	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	a) Nutritional care for Diabetes Mellitus: Aetiology and predisposing factors, symptoms, types, diagnostic and screening criteria, complications, food exchange list, glycemic index, glycemic load treatment and dietary modifications. b) Nutritional care for Hormonal diseases: aetiology, symptoms, and dietary modification for – Cushing's syndrome, Addison's disease, hypothyroidism and hyperthyroidism.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	a) Nutritional care for cardiovascular diseases: Hyperlipidaemia, Hypertension, Atherosclerosis and Congestive cardiac failure - aetiology, clinical findings and dietary management. b) Nutritional care for Neoplastic Diseases: Cancer – Types, stages and markers. Nutrition in the etiology of cancer. Nutritional effects of cancer and cancer therapy, nutritional care of cancer patients.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	a) Nutritional care for diseases of the musculoskeletal system: Arthritis, Osteoporosis and Gout - meaning, symptoms, causes, treatment and dietary management b) Nutritional care for burns: Types, causes, pathophysiology, medical nutrition therapy.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	a) Nutritional care for Renal diseases: Nephritis, Nephrosis, Renal failure and Urinary calculi - Predisposing factors, symptoms and dietary management. Dialysis -types, and modification of diet in dialysis. b) Nutritional care for Inborn errors of metabolism: Phenylketonuria, Galactosemia and Fructosuria, Niemann – pick disease – causes, symptoms, and dietary management.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

V	a)Nutrition care process and Dietary Counseling- Nutrition Care Process: Definition, Steps of Nutrition Care Process. Dietary counselling: clients and counselors, client responsibility, attributes of a successful counselor, steps in counseling process, counseling guidelines. b) Computers in Management of Nutrition Practice: General information – data input, data output, data analysis, data communication, clinical care – communication in patient care and nutritional therapy, Computer application in Preparation of dietary charts for patients.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Uses of food exchange list, Side effects of cancer treatment, Relate structure of skin with types of burns, Dietary Management after renal transplantation, Application of artificial intelligence and computer applications in dietetics practice	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Srilakshmi B.(2019). *Dietetics*.(8th ed)New Age International. New Delhi.
2. Sangeetha Karnik. (2010). *Nutrition and Diet Therapy*.Biotech Pharma Publications.
3. Sumati R Mudambi. (2012).*Fundamentals of Foods, Nutrition and Diet Therapy*. (6th ed).New Age International, New Delhi.
4. De Bruyne, Pinna, Whitney. (2012).*Nutrition and Diet Therapy*. (8th ed). Library of Congress.
5. Avantina Sharma. (2017).*Principles of Therapeutic Nutrition and Dietetics*.CBS Publishers and Distributors.

Reference Books

- 1.Mahatb, S., Bamji., Kamala Krishnasamy, Brahman, G.N.V., (2020).*Textbook of Human Nutrition*. (3rd ed.). Oxford and IBH Publishing Co. P. Ltd., New Delhi.
- 2.Raheena Begum, M. (2015). *Textbook of Foods, Nutrition and Dietetics*. (3- ed.). Sterling Publishers Pvt. Ltd. New Delhi.
- 3.Krause, M. V. Hunesher, M. A. (2013). *Food, Nutrition and Diet Therapy*. W. B. Saunders Company. Philadelphia. London.
- 4.Kathleen ML. and Escott S.(2000) .*Krause'sFood, Nutrition and Diet Therapy*. (9thed.). W.B. Saunders Company Pennsylvania.

Web links

- <https://www.nutrition.org.uk/nutritionscience/health-conditions/heart-disease.html>
- <https://www.medanta.org/severe-burns/>
- <https://labtestsonline.org/conditions/kidney-disease>
- https://www.medicinenet.com/diabetes_mellitus/article.htm
- <http://www.fao.org/3/W0795T/w0795t03.htm>
- <https://vikaspedia.in/health/nutrition>

Journals

- 1.Canadian Journal of Dietetic Practice and Research, Dieticians Canada, Canada
- 2.Journal of Human Nutrition and Dietetics, Wiley-Blackwell, England
- 3.Journal of the Academy of Nutrition and Dietetics, Elsevier
- 4.Journal of Human Nutrition and Dietetics, Wiley online library, UK
- 5.Nutrition Research, Elsevier Science Ltd, United States.
6. European Journal of Clinical Nutrition

Pedagogy

Lecture, Chalk and Talk, Seminar, Assignment, E-Content, PowerPoint Presentation, Quiz.

Course Designers

- Dr.B.THANUJA
- Ms.C.NIVETHA

SEMESTER IV	INTERNAL MARKS:40		EXTERNAL MARKS:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UND4CC4P	DIET THERAPY II (P)	CORE PRACTICAL	4	4

Course Objectives

- To understand the modification of normal diet for therapeutic purpose.
- To acquire the skills of preparing diet for various disease conditions.
- To gain experience in diet counselling for different health conditions.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Describe knowledge on therapeutic diets	K1
CO 2	Interpret nutrition principles in to the treatment and prevention of diseases.	K2
CO 3	Implement diagnostic and treatment measures through the nutrition care Process.	K3
CO 4	Determine principles and importance of therapeutic diets for various diseases	K4
CO 5	Examine tools for diet counselling	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	2	3	3	2
CO2	3	3	3	2	3	3	2	3	3	2
CO3	3	3	3	2	3	3	2	3	3	2
CO4	3	3	3	2	3	3	2	3	3	2
CO5	3	3	3	2	3	3	2	3	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no correlation.

List of Experiments

1. Planning, preparation and diet counselling for Diabetes Mellitus
 - Insulin Dependent Diabetes Mellitus (IDDM)
 - Non Insulin Dependent Diabetes Mellitus (NIDDM)
 - Gestational Diabetes Mellitus (GDM)
2. Planning, preparation and diet counselling for Cardio Vascular Diseases
 - Hypertension
 - Atherosclerosis
3. Planning, preparation and diet counselling for musculoskeletal disorders
 - Gout
 - Osteoporosis
4. Planning, preparation and diet counselling for renal diseases
 - Nephritis
 - Nephrosis
5. Planning, preparation and diet counselling for
 - Burns
 - Cancer

Text Books

1. Srilakshmi B. (2019). *Dietetics*. (8th ed) New Age International, New Delhi.
2. F. P. Antia & Philip Abraham. (2002). *Clinical Dietetics and Nutrition*. (4th ed). Oxford University Press.

Reference Books

1. Barasi, Mary E, Great Britain (2002). *Human Nutrition: Health Perspective* Hodder and Stoughton.
2. Gopalan.C. Rama Sastri.V.B and Balasubramanian.S.C. (2017). *Nutritive Value of Indian Foods* National Institute of Nutrition (ICMR) Hyderabad.

Web links

- <https://www.ncbi.nlm.nih.gov/books/NBK482514/>
- <https://diabetesjournals.org/care/article/42/5/731/40480/Nutrition-Therapy-for-Adults-With-Diabetes-or>
- <https://www.jrnjournal.org/>

Pedagogy

Lecture, Chalk and Talk, Demonstration, Practical, E-Module.

Course Designers

- Dr. B.THANUJA
- Ms.C.NIVETHA

SEMESTER IV	INTERNAL MARKS:25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND4AC6	FOOD CHEMISTRY	ALLIED	4	3

Course Objectives

- To gain insight into the chemistry of foods
- To understand the scientific principles involved in food preparation
- To understand the various properties exhibited by foods

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the Successful completion of the course, students will be able to	Cognitive Level
CO1	Identify the physical and chemical properties of food	K1
CO2	Explain the structural and textural changes of food during cooking	K2
CO3	Predict the cooking quality of various food groups	K3
CO4	Determine pigments and enzymes present in food	K3
CO5	Infer the uses of food additives and leavening agent	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	2	3	3	3	3	3	1
CO2	3	1	1	2	3	3	3	3	3	1
CO3	3	1	1	2	3	3	3	3	3	1
CO4	3	1	1	2	3	3	3	3	3	1
CO5	3	1	1	2	3	3	3	3	3	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Physiochemical properties of food and water a) Introduction to physiochemical properties of food - Physical Properties of water and ice, hydrogen bonding, bound water, water activity, food stability determination of moisture content, acid-base balance b) Types of colloidal system - Colloids, sol, gel, emulsion and foam.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Chemistry of Starch and Sugar a) Starch- Structure, characteristics, components and types, swelling of starch granules, gel formation, gelatinization, retrogradation, effect of sugar, acid, alkali, fat and surface-active agents on starch. b) Sugar - Stages of sugar, artificial sweeteners, solubility and crystallization, factors affecting crystallisation – crystalline and non-Crystalline candies, caramelization, chemistry of milk sugar, non-enzymatic browning and its preventive measures.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Chemistry of Protein a) Properties and components of protein - Coagulation and denaturation of protein, protein concentrates, isolates and hydrolysate and their application, effect of soaking, fermentation and germination on pulse protein. b) Chemistry of protein -Action of heat, acid, and alkali on vegetable and animal protein.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Chemistry of Fats and oils a) Physical and chemical properties of fats and oils - Hydrogenation, winterization, decomposition of triglycerides, shortening power of fats. b) Changes in fats and oils –Changes during cooking, factors affecting absorption of fat in foods.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Pigments, Food additives ,Leavening agents and Enzymes d) Pigments - Types of plant pigments, water and fat soluble pigments, natural colours used in foods, pectins, phenolic components, enzymatic browning in fruits and vegetables. volatile compounds in fruits and vegetables. e) Food additives -Classification and its uses. f) Leavening agents - Types, physical, chemical and biological leavening agents, mechanism of action.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	d) Enzymes: Classification and role of Enzymes in food industry			
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Water activity of any one perishable Natural sweetener Chemistry of coagulation of egg, Heat decomposition of fats Uses of Leavening agents.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

5. Shakuntala Manay. N. (2013). *Foods: Facts and Principles*. (3rd ed.). New Age International Publishers, New Delhi.
6. Swaminathan, M. (2019). *Advanced Text Book on Food and Nutrition*. (2nd ed.). Bangalore Printing and Publishing Co. Ltd, Bangalore.
7. Srilakshmi.B.(2020). *Food Science*. (8th ed). New Age International Publishers, New Delhi.
8. Iqbal, Syed Aftab. (2011). *Advanced Food Chemistry*.Discovery Publishing House, New Delhi.
5. Chopra H,K and Panesar P,S. (2015). *Food Chemistry*. Narosa Publishing House(P) Ltd, New Delhi.

Reference Books

4. Vickie, A., Vaclavik Elizabeth, W.Christian. (2014). *Essentials of Food Science*.(4th ed.). Springer Science and Business Media, New York.
5. Raheena Begum, M. (2015). *Textbook of Foods. Nutrition and Dietetics*. (3rd ed.), Sterling Publishers Pvt. Ltd, New Delhi.
6. Avantina Sharm. (2019). *Textbook of Food Science and Technology*. (3rd ed.). CBS Publishers and Distributors.

Web Links

- <https://www.sciencedirect.com/journal/food->
- <https://www.eolss.net/sample-chapters/c10/e5-08-07-00.pdf>
- <http://egyankosh.ac.in/handle/123456789/69055>

Journals

1. Journal of food chemistry and nutrition science, Pakistan.
2. Food chemistry, Elsevier, United Kingdom.

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Group Discussion

Course Designer

Ms.S. FATHIMA

Ms.T. R. REVATHI

SEMESTER IV	INTERNAL MARKS: 40		EXTERNAL MARKS:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND4INT	INTERNSHIP	INTERNSHIP	-	2

Course Objectives

- To acquire knowledge on basic etiquette of a counsellor.
- To handle different areas of counselling.
- To gain knowledge on report writing.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify different functional areas in hospital	K1
CO2.	Explain work process followed in dietary department	K2
CO3.	Describe the management of human resources in dietary department	K2
CO4.	Prepare diet according to disease condition	K3
CO5.	Ascertain appropriate diet counselling methods	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	2	3	3	2
CO2	3	3	3	2	3	3	2	3	3	2
CO3	3	3	3	2	3	3	2	3	3	2
CO4	3	3	3	2	3	3	2	3	3	2
CO5	3	3	3	2	3	3	2	3	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

DIETARY INTERNSHIP

SYLLABUS

- The Practical work consists of internship in a multispecialty hospital for 15 days.
- Visits to different wards to observe patients requiring special diets.
- Experience in calculating and planning modified diets.
- Supervising and handling the food preparation and service in the dietary department of the hospital.
- Calculating the diet according to medical prescription.
- Accompanying the doctor while visiting the patient.
- Counsel the patient with different health condition.
- Case study- Selecting and observing 5 patients requiring a therapeutic diet in relation to Patient's dietary history - income, occupation, food habits and social factors.

Preparation of the report should include

- History of the hospital
- Facilities provided
- Organization structure
- Duties of the dietitian
- Layout of the dietary unit
- Dietary Department facilities
- Records
- Types of services
- Special dietary preparation
- Storage of food
- Handling of leftovers and shortages
- Sanitation and hygiene
- Case study

Text books

1. Shubhangini A Joshi. (2010). *Nutrition and Dietetics*. McGraw Hill Education Private Limited, New Delhi.
2. Anne Payne, Hellen Barker. (2010). *Advancing Dietetics and Clinical Nutrition*. Churchill Livingstone Elsevier, UK
3. Gopalan C, Rama Sastri B V and Balasubramanian S C. (2016). *Nutritive value of Indian Foods*. National Institute of Nutrition, Hyderabad.

Reference Books

1. Park. A. (2007). *Park's Textbook of Preventive and Social Medicine*. Bharat Publishers, Jabalpur.
2. C.R. Pennington. (2013). *Therapeutic Nutrition – A Practical Guide*. Springer, US.

Pedagogy:

E-content, Lecture, Seminar, Assignment, Demonstration

Course Designers

- Ms.S.FATHIMA
- Ms.M.VINOTHINI

SEMESTER IV	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND4GEC2	MEAL PLANNING FOR THE FAMILY	GENERIC ELECTIVE	2	2

Course Objectives

- To understand the role of nutrition in different stages of life cycle.
- To gain experience in planning menu for different stages of life cycle.
- To develop skills in organizing and evaluating nutrition projects in the community.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify the inter relationship between health and nutrition	K1
CO2.	Explain menu planning principles and RDA for different stages of life cycle	K2
CO3.	Illustrate the importance of nutritional requirements and modified diet for various age groups and conditions	K2
CO4.	Predict nutritional problems throughout life cycle	K3
CO5.	Determine dietary principles in menu planning for various lifecycle and conditions	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	2	3	2	3	3
CO2	3	3	2	3	2	2	3	2	3	3
CO3	3	3	2	3	2	2	3	2	3	3
CO4	3	3	2	3	2	2	3	2	3	3
CO5	3	3	2	3	2	2	3	2	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Principles of Nutrition and Meal planning Classification and functions of Nutrients. Define, malnutrition, over nutrition, under nutrition. RDA. Meal Planning – Definition, Objectives, Principles and Factors affecting Meal Planning. Food guide for selecting an adequate diet.	6	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4
II	Nutrition for Pregnancy and Lactation Pregnancy- Physiological changes, complications, food and nutritional requirements. Dietary guidelines. Lactation – role of hormones in milk production, food and nutritional requirements, advantages of breast feeding.	6	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4
III	Nutrition for Infants and Pre-schoolers Infant -Importance of breast milk, food and nutritional requirements, weaning and supplementary foods. Pre-schoolers - Food habits, food and nutritional requirements, points to be considered while planning a menu. nutritional problems.	6	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4
IV	Nutrition for School going children and Adolescents School going children - Food and Nutritional requirements, nutritional problems. Adolescents - Food and Nutritional requirements and eating disorders.	6	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4
V	Nutrition during Adulthood and Old age Adulthood - Reference man and Reference woman, Food and nutritional requirements. Old age - Nutritional requirements, nutritional problems and dietary management.	6	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Basic Five Food Groups. Draw a sample Menu for pregnancy and lactation. Stunting and wasting. Pointed to be considered while planning a packed lunch. RDA for Adult belonging heavy worker.	-	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5

Text books

1. Srilakshmi B. (2017) *Nutrition Science*. 6th ed. New Age International Publishers, New Delhi.
2. Sumati R. Mudambi., Rajagopal M.V. (2021). *Fundamentals of Foods, Nutrition and Diet Therapy*. New Age International Publishers, New Delhi.
3. Swaminathan M. (2010). *Hand book of Food and Nutrition*. Bangalore printing and publishing co., Ltd, Bangalore.
4. Raheena Begum M. (2019). *A Text Book of Foods, Nutrition and Dietetics*. 3rd ed. Sterling publishers private Limited, New Delhi.

Reference Books

1. Gajalakshmi R. (2018). *Nutrition Science*. 2nd ed. CBS Publishers and distributors Pvt Ltd, New Delhi.
2. Indrani T K. (2005). *Nursing Manual of Nutrition and Therapeutic Diet*. Jaypee Brothers, Medical publishers (p) Ltd, New Delhi.
3. Khumud Khanna etal .(2020). *Text book of Nutrition and Dietetics*. 2nd ed.Elite Publishing House Pvt. Ltd New Delhi..

Web links

- <https://www.ncbi.nlm.nih.gov/books/NBK209825/>
- <https://www.who.int/nutrition/topics/nutrecomm/en/>

Journals

1. *Nutrition*, Elsevier Science Inc, United States.
2. *Journal of Youth and Adolescence*, Springer/Plenum Publishers, United States.
3. *Journal of Food and Nutrition Research*, Food Research Inst, Bratislava, Slovakia

Pedagogy: E-content, Lecture, Power point presentation, Seminar, Assignment, Quiz.

Course Designers

- Ms.E.AGALYA
- Ms.N.GANGA DEVI

SEMESTER IV	INTERNAL MARKS: 40		EXTERNAL MARKS:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND4SEC1P	BASICS IN FOOD PRODUCTION (P)	SKILL ENHANCEMENT	2	2

Objectives

- To acquire knowledge on culinary skills in food production.
- To gain knowledge on preliminary techniques.
- To observe the various methods and techniques of cooking.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Identify the Basic Cooking methods and pre-preparations	K1
CO 2	Explain the uses of equipment in food production	K2
CO 3	Apply the practical skills and techniques used to prepare food	K3
CO 4	Infer the culinary skills in the preparation of food production	K4
CO 5	Determine the basic preparation of stock, soups, sauces and salads	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3	3	3	2	2	2
CO2	3	3	3	2	3	3	3	2	3	2
CO3	3	3	3	2	3	3	3	2	2	2
CO4	3	3	3	2	3	3	3	2	2	2
CO5	3	3	3	2	3	3	3	2	2	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

List of Experiments

1. Equipments – Identification, Description, Uses and handling.
2. Basic Cooking methods – Moist heat, dry heat and combination methods
3. Pre- preparation Techniques – Cutting techniques, paring, peeling, grating, grinding, sieving, steeping.
4. Stocks, Types of stock (Basic stock - Brown, white, fish, vegetable) Preparation of stock recipes.
5. Soups, Classification with examples, Basic recipes of Consommé Soup – Classification, Preparation and serving of Soups, common garnishes for soups.
6. Sauces - Basic Mother Sauces (Béchamel, Espagnole, Veloute, Hollandaise, Mayonnaise, Tomato Sauce) Preparation of sauce recipes.
7. Salad – Salads and its types, Salad dressings Salad Preparation (Potato Salad, Beetroot Salad, Green Salad, Fruit Salad, Lentil Salad).

Text Books

1. Krishna Arora.(2008). *Theory of cookery* Fronk Bros and Co. Publishers, New Delhi.
2. R. Singaravelavan.(2016). 2nd ed. *Food & Beverage Service*. Oxford University press. India.
3. Yogambal Ashokkumar.(2009). *Text book of Bakery and Confectionary* Prentice-hall of India Pvt. Ltd
4. V. Cessarani and R.Kinton 2002 *Practical Cookery* Hodder and Stoughton publishers

Reference Books

1. Krishna Arora, *Theory of Cookery*, 2008 Fran Brothers & Company (Pub) Pvt. Ltd.
2. Bali, Parvinder. (2013) *Quantity Food Production Operations and Indian Cuisine- S.oxford*, London
3. Aggarwal, D.K. (2006). *Kitchen Equipment & Design*, Aman Publications, New Delhi.
4. Vikas Singh, (2011) *Text Book of food Production (BTK)*, Aman Pub., N. Delhi.
5. Parvinder S. Bali. (2014) *Food Production Operations*, 3rd Edition, Oxford University Press, New Delhi.
6. Philip, Thangam E. (2009) *Modern Cookery*, 5th Edition, Anna Salai, Chennai.

Web links

- <https://bngkolkata.com/kitchen-equipment/>
- <https://www.chelseagreen.com/2023/fundamentals-stocks-broths/>
- https://www.researchgate.net/publication/359336449_Chapter_no_2_Soups_21_Classification_of_Soups_with_5_examples_each_22_Consomm'eDefinition_Ingredients_Clarification_Recipe_for_one_ltr_five_variation_23_Garnishesh_Accompaniments_for_soup_Consomm'es
- <https://hmhub.in/salads-salad-dressings/>

Pedagogy

E-content, Lecture, Power Point Presentation, Seminar, Assignment, Visit to Food Processing and Packaging units.

Course Designers

- Ms. T. R. REVATHI
- Ms. R. ARTHY

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (IHCYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS



B.Sc., NUTRITION AND DIETETICS

SYLLABUS

2022-2023 and Onwards



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS
B.Sc., NUTRITION AND DIETETICS
LEARNING OUTCOME BASED CURRICULUM FRAME WORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2022-2023 onwards)
Semester V

Semester	Part	Course	Title	Course Code	Inst .Hrs. / week	Credits	Hrs.	Exam		Total
								Marks		
								Int	Ext	
V	III	Core Course – VI(CC)	Food Processing and Preservation	22UND5CC6	6	6	3	25	75	100
		Core Practical – V(CP)	Food Processing and Preservation (P)	22UND5CC5P	3	3	3	40	60	100
		Core Course - VII(CC)	Basics in Research Methodology and Computer Applications	22UND5CC7	6	6	3	25	75	100
		Core Course – VIII(CC)	Community Nutrition	22UND5CC8	6	6	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. Food Standards and Quality Control	22UND5DSE1A	5	4	3	25	75	100
			B. Food Product Development and Marketing	22UND5DSE1B						
			C. Front Office Management and Housekeeping	22UND5DSE1C						
	IV	Ability Enhancement Compulsory Course - IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Bakery and Confectionary (P)	22UND5SEC2P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation					
		TOTAL			30	29				700

SEMESTER V	INTERNAL MARKS: 25	EXTERNAL MARKS:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND5CC6	FOOD PROCESSING AND PRESERVATION	CORE	6	6

Course Objectives

- To understand the values of food processing and preservation.
- To apply food processing techniques to various food groups.
- To acquire knowledge on food preservation methods.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On Successful Completion of the course, students will be able to	
CO1	List the principles, methods and benefits of processing and preservation	K1
CO2	Explain changes and nutritional losses during processing and preservation of food groups.	K2
CO3	Prepare the different food groups into value added products	K3
CO4	Predict the importance of packaging in processing and preservation	K3
CO5	Ascertain the uses of storage in different food products	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	-	-	2	3	3	3	3	3	1
CO2	3	-	-	2	3	3	3	3	3	1
CO3	3	-	-	2	3	3	3	3	3	1
CO4	3	-	-	2	3	3	3	3	3	1
CO5	3	-	-	2	3	3	3	3	3	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium)Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Food processing – Definition, principles, classification- minimally processed foods, preserved foods, manufactured foods, formulated foods, methods and benefits of food processing, effect of food processing on nutrients, scope of food processing industry, sectors of food processing industry, future prospects and trends in modern food processing. Processing of cereals and Millets - Processing of cereals-Milling process, stone milling, roller milling. Cereals and Millets products- wheat, rice, corn, barley, semolina, amylase rich food, macaroni products, puffed rice, flaked rice and value- added products, packaging, storage.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4
II	Processing of pulses -Germination, fermentation, agglomeration, decortication, milling, puffing. By - products of pulses- dals and grams, processed soya. Processing of nuts and oil seeds- coconut, groundnut, sesame, sunflower seeds, flaxseeds Processing – Extraction of oil and refining, meal concentrates and value addition, nutritional losses during processing, packaging, storage. Processing of spices and condiments - Cumin, fenugreek, coriander, fennel, poppy, aniseed, cinnamon, chilli, cardamom, turmeric, ginger, tamarind, nutmeg, asafoetida, Black pepper- Processing , cleaning, reconditioning and grinding, packaging, storage.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4
III	Processing of milk- Filtration, homogenization, pasteurization, drying, fermentation. Milk products- cheese, panner, milk powder, ice cream, khoa, packaging, storage.	18	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4

	Processing of flesh foods- Processing of fleshy foods by freezing, smoking, drying, canning, packaging, storage. Processing of fruits and vegetables -Processing of fruits and vegetables by pickling, freezing, drying and canning. Vegetable and fruit products – preserves, jams, jellies, squashes, concentrates, packaging, storage. Processing of sugar- Extraction, clarification, and crystallization, separation of crystals, refining of sugar, recovery of sugar molasses, packaging, storage.			
IV	Food preservation- principles of food preservation and techniques of food preservation. Food preservation by low and high temperature: Freezing and refrigeration: Introduction to refrigeration - cool storage - freezing – definition - principle of freezing - freezing curve -changes occurring during freezing - types of freezing - slow freezing, quick freezing. introduction to thawing, changes during thawing and its effect on food. Thermal Processing- Commercial heat preservation methods – Sterilization, commercial sterilization, Pasteurization, and Canning – bottling.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4
V	Food preservation by drying, dehydration and irradiation: Definition of drying - preservation, sun drying - dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying - normal drying curve - names of types of driers used in the food industry. Evaporation – Definition, factors affecting evaporation, names of evaporators used in food industry. Kinds of ionizing radiations used in food irradiation-mechanism of action - uses of radiation processing in food industry.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4

VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Importance of food processing. Uses of soaking. Different cuts of fleshy foods. Application of Pasteurization. Working principles of driers	-	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4

Text Books

1. Vikas Ahluwalia.(2007). *Food Processing*. Paragon International Publishers,
2. Anupama Rani. (2010). *Food Processing Preservation and Storage*. Sonali Publications

Reference Books

1. Norman N. Potter, Joseph H. Hotchkiss. (2007). *Food Science* , (5th Ed). Cbs Publishers and Distributors Pvt . Ltd
2. Avantina Sharma.(2006). *Textbook of Food Science & Technology*. International Book Distribution Co
3. Shubhangini A Joshi (2010). *Nutrition and Dietetics*. McGraw Hill Education Pvt. Ltd
4. Janice Albert. (2010). *Innovations in food labelling*. Woodhead publishing ltd, New Delhi.

Web Links

- <http://www.fao.org/3/a-au104e.pdf>
- https://apps.icarda.org/wsInternet/wsInternet.aspx/DownloadFileToLocal?filePath=Tools_and_guidelines/Technical_bulletin3.pdf&fileName=Technical_bulletin3.pdf
- <https://www.niir.org/books/book/handbook-on-spices-condiments-cultivation-processing-extraction-h-panda/isbn-9788178331324/zb>
- <https://pubmed.ncbi.nlm.nih.gov/26312771/>

Journals

1. Trends in Food Science and Technology, Elsevier Bv, Netherlands
2. Journal of Food Engineering, Elsevier, Netherlands
3. Journal of Food Processing and Technology, Wiley, ISSN 1745-4549, Ohio state

Pedagogy:

E-content , Lecture, Power point presentation, Seminar, Assignment, Demonstration

Course Designers

- Ms. M.VINOTHINI
- Ms. E.AGALYA

SEMESTER V	INTERNAL MARKS: 40		EXTERNAL MARKS:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND5CC5P	FOOD PROCESSING AND PRESERVATION (P)	CORE PRACTICAL	3	3

Course Objectives

- To understand the importance of food processing and preservation.
- To gain insight on the practical aspects of food processing and preservation.
- To develop entrepreneurial skills.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On Successful Completion of the course, students will be able to	
CO1	Define the principles and techniques of processing and preservation	K1
CO2	Interpret the pH of different food products	K2
CO3	Classify different types of preservatives	K3
CO4	Prepare value added food products	K3
CO5	Examine the sensory aspects of different food products	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	-	-	2	3	3	3	3	3	1
CO2	3	-	-	2	3	3	3	3	3	1
CO3	3	-	-	2	3	3	3	3	3	1
CO4	3	-	-	2	3	3	3	3	3	1
CO5	3	-	-	2	3	3	3	3	3	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium)Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

List of Experiments

1. Principles and techniques of food processing and food preservation.
2. Evaluation of foods using organoleptic method.
3. Determination of pH of different foods using pH meter.
4. Preparation of extruded products – Pasta / noodle, popcorn.
5. Preparation of germinated and fermented Products – Green gram sprout, Idly batter
6. Preparation of chutneys– Tamarind and gongura.
7. Preparation of milk products – Paneer, curd, cheese, khova.
8. Preservation of foods by sugar- Jam, jelli, marmalade, squash, tuity fruity, amla preserves and fruit bar.
9. Preservation of foods by salt and oil –Lemon, mango and garlic pickles.
10. Preservation of foods by acid – sauerkraut, sauce.
11. Preservation of foods by drying - Vathal , vadam.

Text Books

1. Vikas Ahluwalia.(2007). *Food Processing*. Paragon International Publishers,
2. Anupama Rani. (2010). *Food Processing Preservation and Storage*. Sonali Publications

Reference Books

1. Norman N. Potter, Joseph H. Hotchkiss. (2007). *Food Science* , (5th Ed). Cbs Publishers and Distributors Pvt . Ltd
2. Avantina Sharma.(2006). *Textbook of Food Science & Technology*. International Book Distribution Co
3. Shubhangini A Joshi (2010). *Nutrition and Dietetics*. McGraw Hill Education Pvt. Ltd
4. Janice Albert. (2010). *Innovations in food labelling*. Woodhead publishing ltd, New Delhi.

Pedagogy:

E-content , Power point presentation, Demonstration, Practical.

Course Designers

- Ms. M.VINOTHINI
- Ms. E.AGALYA

SEMESTER - V	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND5CC7	BASICS IN RESEARCH METHODOLOGY AND COMPUTER APPLICATIONS	CORE	6	6

Course Objectives

- To understand research methods and data processing
- To gain knowledge on data analysis using statistics
- To know about computer applications in data analysis

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Identify the research problem and research design	K1
CO 2	Illustrate the methods involved in sampling, collection of data and processing	K2
CO 3	Apply manuscript writing techniques for various purposes	K3
CO 4	Analyze data using suitable statistical analysis and computer applications	K4
CO 5	Assess the character of the research and be capable of drawing research conclusions tailored to specific requirements	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	1	1	1	2	3	3	3	3	1
CO2	2	1	1	1	2	3	3	3	3	1
CO3	2	1	1	1	2	3	3	3	3	1
CO4	2	1	1	1	2	3	3	3	3	1
CO5	2	1	1	1	2	3	3	3	3	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamentals of Research and Research Design: Definition, objectives, importance and characteristics of research. Steps in research process. Research problem – Definition, selection, Necessity of Defining the Problem, Technique Involved in Defining a Problem, Types of research- Descriptive, Analytical, Applied, Fundamental, Quantitative, Qualitative, Conceptual and Empirical research. Research Design - research design in case of exploratory research studies, research design in case of descriptive and diagnostic research studies and research design in case of hypothesis-testing research studies.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Sampling and Scaling Technique: Different sampling Methods-Probability and non-probability sampling methods. Sampling and non-sampling errors, sample size, sampling fundamentals and theory of sampling. Scaling Techniques: Comparative (Rank Order, Paired Comparison and q-sort) and Non-comparative (Likert Scale, Thurston Scale, Semantic Differential Scale)	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Data Collection and Analysis: Primary data collection methods - preparation of schedules and questionnaires. Interview method of enquiry, training of interviewers. Secondary data collection method- Reliability of data, suitability of data, adequacy of data. Processing of data – Editing, Coding, Classification and Tabulation. Measures of central tendency- Mean, median, mode, measures of dispersion/variability - range, variance, standard deviation, standard error, coefficient of variation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Research report writing and Research Ethics Components or layout of a thesis - Introduction, review of literature, methodology, results and discussion, summary and conclusion, bibliography, footnotes and appendix. Types of report- Technical reports, popular reports. Manuscript writing – original, review article, abstract, research article. Research ethics- Principles of research ethics, publication ethics, publication misconduct.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

V	Use of Computer Applications in Research Using Excel for data management, Use of SPSS for Data Analysis and Interpretation, Tabulation and Graphical Representation of Data, Software for Reference Management and Detection of Plagiarism Quoting, Paraphrasing, and Avoiding Plagiarism.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Hypothesis and its types, Calculate sample size using unknown population size formula, Difference between Questionnaire and Interview schedule, Bibliography formats and styles (APA, Chicago, MLA, ASA), Use of computer applications in data processing.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

RELATED EXPERIENCE

- 1.Design interview schedule / questionnaire by applying research ethics.
2. Processing of data – editing, coding, classification and tabulation
3. Data analysis - Calculate mean, median, mode, standard deviation using SPSS
- 4.Graphical representation of data using SPSS
5. One way ANOVA analysis using SPSS

Text Books

1. Kothari G.R.(2004).*Research Methodology*. New Age International (P) Ltd
2. Dr.Rajamohan.S. and Thilagaraj A.(2010).*Introduction to Statistics*(2nd ed). Learntech Press
- 3.Saravanavel P. (2013).*Research Methodology*. Kitab Mahal Allahabad

Reference Books

1. VijayalakshmiG. and Sivapragasam .C. (2008).*Research Methodology*. MJP Publishers
2. Borse. M. N. (2004).*Hand Book of Research Methodology*. Shree Niwas Publications, Jaipur(India).
3. Grumani N.(2014).*Research Methodology for Biological Sciences*. MJP Publishers
4. Ramadas. R. and Wilson. A.(2014). *Research and Writing*. MJP Publishers.
5. Gupta S. P.(2002).*Statistical Methods*. Sultan Chand & Sons, New Delhi.

Web Link:

1. https://www.google.co.in/books/edition/Fundamental_of_Research_Methodology_and/zrFw-bt6PKIC?hl=en&gbpv=1&dq=research+methodology+books+pdf&p
2. https://www.google.co.in/books/edition/Research_Methodology/k6pMrsB5T_oC?hl=en&gbpv=1&dq=research+methodology+books+pdf&printsec=frontcover&bsh=m=rimc/1
3. <https://egyankosh.ac.in/bitstream/123456789/11204/1/Unit-1.pdf>
4. <https://egyankosh.ac.in/bitstream/123456789/8380/1/Unit-10.pdf>
5. <https://www.ignouhelp.in/ignou-mlie-102-study-material/>

Journals:

1. BMC Medical Research Methodology, Biomed Central Ltd, England.
2. Health Services and outcomes Research Methodology, Kluwer Academic Publishers, Netherlands
3. International Journal of Social Research Methodology: Theory and Practice, Taylor& Francis United Kingdom
4. Research Methodology in Strategy and Management, Elsevier Bv, Netherlands

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designers

Dr. B.THANUJA

MS. S. FATHIMA

SEMESTER V	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND5CC8	COMMUNITY NUTRITION	CORE	6	3

Course Objectives

- To provide information regarding nutritional assessment
- To enable students to understand national nutritional problems and their implications.
- To acquaint them knowledge regarding nutrition intervention programmes.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On Successful Completion of the course, students will be able to	
CO1	Identify ecological factors leading to malnutrition	K1
CO2	Describe role of nutrition intervention programmes	K2
CO3	Apply nutrition education programme and create nutrition awareness.	K3
CO4	Apply the skills in assessment of nutritional status of community.	K3
CO5	Determine the strategies for Improving nutrition and health status of the community.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	3	2	3
CO2	3	3	2	3	3	3	3	3	2	3
CO3	2	3	3	3	2	3	3	3	2	3
CO4	3	3	3	3	2	3	3	3	2	3
CO5	3	3	3	3	2	3	3	3	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium)Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Malnutrition and National Nutrition Policy a. Ecology of Malnutrition - Definition, prevalence malnutrition, vicious cycle, ecological factors leading to malnutrition-income, family size, dietary pattern, occupation, customs, food fads, fallacies, ignorance and other factors. Synergism between malnutrition and infection. b. National Nutrition Policy – objectives, Strategies-Direct and Indirect , Food Security-Dimension, activity	18	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4
II	Nutritional Problems and Nutritional Assessment a. Nutritional Problems - Prevalence, causes, consequences and prevention of common nutritional problems – Protein Energy Malnutrition (PEM), Vitamin A Deficiency Disease, Anemia, Iodine Deficiency Disorder (IDD),Intra burden, Double burden, Triple burden.. b. Assessment of Nutritional status -Direct method - Anthropometry, biochemical, biophysical and clinical assessment). Indirect method - Dietary Survey (24-hour dietary recall, food frequency questionnaire, diet history, dietary record),Vital statistics.	18	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4
III	Nutrition Intervention & Immunization Programmes a. Nutrition intervention programmes in India – School Lunch Programme, Chief Minister's Nutritious Noon Meal Program (CMNNMP), Chief Minister's Breakfast Scheme, Integrated Child Development Services (ICDS), Nutritional programmes for adolescent girls, Primary Health Care (PHC), Public Distribution System (PDS), Poshan Abhiyan 2.0, Annapoorna Scheme. b. Immunization–Universal Immunization Programmes(UIP),Immunization schedule, milestones, improving coverage, improving quality, and new vaccine introduced.	18	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4

IV	National, International and Voluntary Agencies to Promote Community Health a. National Organization concerned with food and Nutrition – Indian Council of Medical Research (ICMR), National Institute of Nutrition (NIN), National Nutrition Monitoring Bureau (NNMB), Central Food Technological Research Institute (CFTRI), Defence Food Research Laboratory (DFRL), and National Institute of Public Cooperation and Child Development (NIPCCD), Food and Nutrition Board (FNB). b. International Organization concerned with Food and Nutrition- Sustainable development goals. Food and Agricultural Organization (FAO), United Nations International Children's Emergency Fund (UNICEF), World Bank, World Health Organization (WHO)	18	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4
V	Nutrition Education and Programmes a. Nutrition Education - Definition, importance, principles and methods of nutrition education. Nutrition Intervention Theories-Behavioral Theory, Social Cognitive Theory Meaningful Learning Model. Role of audio-visual aids in nutrition education-Information Electronics Communication Technology. b. Organization of nutrition education programmes - principles, planning, executing and evaluating nutrition education programmes, problems encountered in conducting nutrition education programmes. c. Nutritional recommendation for Epidemics: health and social measures for COVID-19.	18	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Relationship between infection and malnutrition. Fluorosis. Special nutrition Programme. Role of ICMR in public health. Importance of E-content to create Nutritional Awareness.	-	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4

TextBooks

1. Swaminathan, M., (2007), Essentials of Food and Nutrition. An Advanced Textbook The Bangalore Printing and Publishing Co. Ltd, Bangalore.
2. Srilakshmi, B., (2020), Nutrition Science, New Age International Publication, New Delhi

ReferenceBooks

1. Park, A., (2007), Park's Textbook of Preventive and Social Medicine, (11th ed), M/S Banarasidas, Bharat Publishers, 1167, Prem Nagar, Jabalpur.
2. Bamji M.S, PrahladRao N, Reddy V.,(2004), Textbook of Human Nutrition, (2nd ed), Oxford and PBH Publishing Co. Pvt. Ltd , New Delhi.
3. Bhatt D.P,(2008), Health Education, KhelSahitya Kendra, New Delhi.
4. Gibney, M.J., Margetts, B.M., Kearney, J.M., Arab, L., (2004), Public Health Nutrition, Blackwell Publishing Co. UK.

Web links

1. <https://www.worldbank.org/en/topic/agriculture/brief/food-security-update/what-is-food-security>
2. <https://vikaspedia.in/health/nutrition/malnutrition>
3. <https://egyankosh.ac.in/bitstream/123456789/33443/1/Unit-16.pdf>

Journals

1. <https://www.nutritionintl.org/>
2. <https://www.india.gov.in/national-nutrition-policy-ministry-women-child-development?page=3>

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Quiz, Group project.

Course Designers

Ms.C.NIVETHA
Ms.N.GANGA DEVI

SEMESTER V	INTERNAL MARKS:25	EXTERNAL MARKS:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UND5DSE1A	FOOD STANDARDS AND QUALITY CONTROL	DISCIPLINE SPECIFIC ELECTIVE - I	5	4

Course Objectives

- To gain knowledge about food quality and safety system.
- To Know the techniques of evaluation of food quality.
- To understand common food adulterants and toxins.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	On the successful completion of the course, students will be able to Define food safety and food regulations in India and cite examples for quality checking of raw food materials	K1
CO 2	Describe specification for different food products and food additives	K2
CO 3	Explain and demonstrate the method of sensory and objective evaluation for assessing food quality indices	K3
CO 4	Determine the possible food toxins and microbes for quality deterioration of food	K4
CO 5	Apply and compute quality management systems to food processing unit	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	1	3	3	1	2	1
CO2	3	2	3	1	1	3	3	1	2	1
CO3	3	2	3	1	1	3	3	1	2	1
CO4	3	2	3	1	1	3	3	1	2	1
CO5	3	2	3	2	1	3	3	1	2	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Food Safety and Quality a) Food Safety and Quality -Introduction to Food Safety, History of food regulations in India, Quality features of foods, quality checking of raw material and processed foods, Factors affecting food quality, Food quality indices – cereals, pulses, nuts and oil seeds, vegetables, fruits, milk and milk products, non – vegetarian foods, oils, spices and condiments, processed foods – canned foods, baked products and preserved foods. b) Quality Control Measure - objectives, and Advantages of quality control and stages of quality control	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Food Additives and their specifications a) .Food Additives: - Classification of food additives, usages and optimal level recommended for usage as specification – Food colors, Flavoring agents, leavening agents, preservatives, Acidity regulators, Anticaking agent, Antifoaming agent, Bulking agent, Foaming agent, Artificial sweeteners, Emulsifier and Stabilizers. b) Food specifications: objectives and advantages, Food specification for various food products – starchy foods, milk and milk products, fruit products, beverages, spices and condiments, oils and fats, preserved foods.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Quality Evaluation of Food a) Subjective evaluation: Sensory characters of food, organs involved in assessment – physiological process, types of sensory tests - Scoring Tests, Paired Comparison Tests 1, Paired	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	Comparison Tests 2, Triangle Test, Duo Trio Test, Ranking test, requirements to conduct sensory evaluation, Role and defects in sensory evaluation – panel member, essential qualities of a panel member, procedure of sensory evaluation, Score card: Hedonic Rating Scale, and Points to be remembered while preparing score card b) Objective evaluation: objectives, requirements, different tests and instruments used for objective evaluation: sugar content - Refractometer, acidity - Ph meter, viscosity - Rheometer, moisture - Moisture balance, colour - Colorimetry, Texture – Texturometer Penetrometer, advantages and limitations.			
IV	Food Toxins and Adulterants a) Food Toxins: Mycotoxins – aflatoxins, aspergillus and penicillium species, mushroom poisoning, sea food toxins. Other toxins naturally occurring in foods: Lathyragens, haemagglutinins, goitrogens. Toxic minerals and other inorganic compounds in food and water; selenium, fluorine, nitrates and nitrites, oxalates and phytates. b) Food Adulteration: Definition, Types, Common food adulterants; tests for detecting food adulterants, contamination with toxic metals, pesticides and insecticides; effects of food adulteration and contamination, measures to control food adulteration, Prevention of food adulterants act	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

V	Food Standards and Regulations: a) Hazard Analysis- Physical hazards (metals, glass, etc.), Chemical hazards (food additive toxicology, pesticides, antibiotics, heavy metals and packaging components), Biological hazards (epidemiology of biological pathogens: virus, bacteria and fungi), Hazard Analysis Critical Control Point (HACCP). b) Food Standards and Food Laws Voluntary standards and Certification system – BIS and AGMARK, International Food Standards - Codex Alimentarius Commission (IFS), Food Safety and Standards Authority of India (FSSAI). Good Manufacturing Practice (GMP), Food and Drug Administration (FDA).	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Importance of food safety, Role of food additives in baked products, Importance of score card, List out the adulteration in spices, Function of ISO.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Dr.A.N.Jha, *Environmental Regulation and Food Safety* , 2009, ALP Books, New Delhi
2. Swaminathan, M, *Essentials of Food and Nutrition*, 2014, BAPCO, Bangalore
3. Swaminathan, M, *Hand Book of Food Science and Experimental Foods*, 2018, BAPCO, Bangalore
4. Srilakshmi B, *Food Science*, 2016, New Age International Publishers, NewDelhi.

Reference Books

1. Neal D. Fortin, *Food Regulation Law, Science, Policy, and Practice*, 2016, Wiley
2. Hui, Y.H, *Food Plant Sanitation*, 2003, Marcel Dekker, Inc.
3. Potter N, and Hotchkiss J.H, *Food Science*, 2008, CBS Publications and Distributors, Daryaganji, NewDelhi.
4. EdwardG.Schilling, *Acceptance Sampling in Quality control*, 2nd Edition, CRC Press,Mallbook., 1996
5. EillianH.Meyer, *Food Chemistry*, Affiliated West PressPvt.,Ltd, New Delhi,1973.
6. Pomeraz, Y. and MeLoari, C.E. (1996): *Food Analysis: Theory and Practice*, CBS publishers and Distributor, New Delhi.

Journals

1. Food Analytical Methods, Springer, United States
2. Food and Drug Law Journal, Food Drug Law Inst, United States
3. Journal of food quality, open access, United Kingdom
4. Food Quality and safety, Oxford Academic, China

Web links

- <https://www.ams.usda.gov/selling-food/product-specs>
- https://link.springer.com/chapter/10.1007/978-1-4615-6998-5_39
- <https://www.fda.gov/food/guidance-regulation-food-and-dietary-supplements/hazard-analysis-critical-control-point-haccp>
- <https://www.sciencedirect.com/topics/food-science/food-adulteration>

Pedagogy

E-content , Lecture, Power point presentation, Seminar, Assignment, Demonstration.

Course Designers

- Ms. N. GANGA DEVI
- Ms. R. ARTHY

SEMESTER V	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND5DSE1B	FOOD PRODUCT DEVELOPMENT AND MARKETING	DISCIPLINE SPECIFIC ELECTIVE	5	4

Course Objectives

- To understand the various aspects of newer food product development.
- To learn the marketing strategies.
- To know the government regulation pertaining to new food product.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Define the basic standards pertaining to new product development	K1
CO 2	Describe role of market research and marketing efforts in the product development process	K2
CO 3	Apply the knowledge of food laws and sensory science to food product development	K3
CO 4	Infer the new product categories in food market and their characteristics.	K4
CO 5	Associate various aspects of new food product development and marketing	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	1	2	3	1	1	1	1
CO2	3	2	1	1	2	3	1	1	1	1
CO3	3	2	1	1	2	3	1	1	1	1
CO4	3	2	1	1	2	3	1	1	1	1
CO5	3	2	1	1	2	3	1	1	1	1

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVEL EVEL
I	New product development Definition, principles and classification, steps in food product development, characterization and factors influencing new product development. Health concerns impact of technology and market place influence.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Formulation of new product Selection of raw materials, portion size, standardization methods, calculation of nutritive values, cost production, shelf life. Development of prototype product-purposes, finalizing the design, choosing the manufacturing approach, post-processing, assembly, validation, refinement, and improvements.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Sensory and Objective evaluation Sensory evaluation-establishing sensory panels, designing score card, conduct a sensory evaluation test, shelf life analysis, objective evaluation- instruments used for physio-chemical and microbiological evaluation.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Packaging Types of packing materials, package testing, food labelling and nutritional labelling, developing packaging systems for maximum stability and cost effectiveness, new product development – patent, patent laws, international code for Intellectual property rights (IPR).	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Marketing Approaches to study marketing and marketing functions, food choice models and new product trends, market structure, market efficiency and market integration. Role of government in promoting agricultural marketing.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Genetically modified foods Specific consumer oriented foods Importance of objective evaluation Factors affecting success and failures in new product development Agricultural and Processed Food Products Export Development Authority (APEDA)	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. Avantina Sharma. (2012). *Textbook of Food Science and Technology*. CBS Publishers and Distributors Pvt.Ltd.
2. N. Shakunthala Manay M. Shadaksharaswamy. (2008). *Food Facts and Principles*. New Age International Publishers, New Delhi.
3. Vikas Ahluwalia. (2007). *Food Processing*. Paragon International Publishers, New Delhi

Reference Book

1. Gordon W. Fuller. (2011). *New Food Product Development from Concept to Market Place*, CRC Press
2. D.G. Rao. (2016). *Fundamentals of Food Engineering*. PHI Learning Private Limited, New Delhi

Web Link:

- <https://savoreat.com/product-development-of-food-strategy-innovations-trends-and-examples/>
- <https://pubmed.ncbi.nlm.nih.gov/18582508/>
- http://www.niftem-t.ac.in/food_product_development.php
- <https://www.youtube.com/watch?v=oHM1Sr9p60Y>
- <https://www.shu.ac.uk/courses/food-and-nutrition/msc-food-consumer-marketing-and-product-development/full-time>

Journals:

1. Journal of Food Products Marketing, Volume 29, Issue 7 (2023) The Ohio State University Columbus, Ohio Print ISSN: 1045-4446 Online ISSN: 1540-4102
2. Journal of International Food and Agribusiness Marketing, The SCImago Journal & Country Rank (Elsevier B.V.). ISBN 08974438, 15286983

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designers

MS. S. FATHIMA

MS.T.R.REVATHI

SEMESTER V	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND5DSE1C	FRONT OFFICE MANAGEMENT AND HOUSEKEEPING	DISCIPLINE SPECIFIC COURSE	5	4

Course Objectives

- To gain knowledge on role of front office and housekeeping as functional area.
- To understand the functions of front office and housekeeping department.
- To study the operational aspects of front office and housekeeping.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	On the successful completion of the course, students will be able to Define the guest cycle, types and process of reservation in a hotel.	K1
CO 2	Describe knowledge on front office processes on Registration procedures.	K2
CO 3	Apply in-depth knowledge on the guest services provided during the stay in a hotel.	K3
CO 4	Determine contents, cleaning methods, various service procedures of guestrooms.	K4
CO 5	Infer the organization structure, Staff, their duties, and responsibilities in cleaning agents and equipment in Housekeeping	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	1	1	-	3	3	3	2	3	3	2
CO2	1	1	-	3	3	3	2	3	3	2
CO3	1	1	-	3	3	3	2	3	3	2
CO4	1	1	-	3	3	3	2	3	3	2
CO5	1	1	-	3	3	3	2	3	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	a. Introduction to front office - Introduction to front office as an department. Importance and role of front office . Functions of front office, Types of hotel rooms, Attributes of front office staff members. Duties of front office staff. b. Layout of front office department - Front Office Layout -Sections of the front office department and their layout and importance – Reservation, Reception, Concierge, Bell desk, Lobby, Telephones, Cashier, Inter and Intra-department coordination. Equipments and front office systems.	15	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4
II	a. Front office organization and operations: Organization structure, Front desk operations & functions, Equipments handling at front office, Basis of Room charging, Tariff fixation, Introduction to the guest cycle. b. Reservation operations: Meaning, Importance, sections, Modes and sources of reservation. Different channels of reservation. Tools of reservation. Systems of reservation. reservation amendment and cancellation procedure. Group reservation	15	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4
III	a. Guest registration and check in procedure: Meaning, Importance, check in procedure, Pre arrival activities ,On arrival and post arrival. Guest registration documents. Luggage handling at the time of arrival. Room selling techniques. b. Checkout procedures: The Guest Departure and Post Departure Services at Front Desk, guest services, miscellaneous charges, credit security measures, express check out, early and late check outs, group departures, post departure courtesy services	15	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4
IV	a. Hotel housekeeping: Definition, Importance, sections of Housekeeping, Responsibilities of the Housekeeping department. Housekeeping Department: Organizational framework of the Department, Inter departmental Coordination with more emphasis on Front office and the Maintenance department.	15	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4

	b. Room servicing: Cleaning of Guest Rooms & Bathrooms: Daily cleaning of (Occupied/Departure/ Vacant/ Under Maintenance/VIP rooms (Systematic Procedures), Special Cleaning, Weekly Cleaning /Spring Cleaning, Evening service/ Turn Down Service, System & procedures involved, Forms and Formats, Replenishment of Guest supplies and amenities, Use of Maids Cart & Caddy.			
V	a. Routine services and cleaning process: Cleaning of Check out room, Occupied Room, Vacant Room. Evening service. Cleaning Equipment - General considerations & selections, Classification & Types of equipment's, Care & maintenance. Cleaning agents - General criteria for selection, Classification, Cleaning of Public Areas: Cleaning Process, Cleaning and upkeep of Public areas. b. Floor finishes: Classification and characteristics: Hard and soft floor finishes methods of cleaning. Wall Finishes- Different wall finishes in rooms, public and back areas, Wall papers: Uses and demerits.	15	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4
VI	SELF STUDY (Not to be included for External Examination) Responsibilities of front office staff, Types of reservation, Cash and credit control in check out procedures, Hygiene and Grooming Standards of Housekeeping Personnel, Uses of wall finishes.	-	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4

Text Books

1. Ahmed Ismail. (2004). *Front office operations And Management*. Delmar Publications
2. Sudhir Andrews.(2014). *Hotel Front Office a Training Manual*, (3rd edition) McGraw Hill Education (India) Private Limited.
3. Dr. B.K.Chakravarthi.(2011). *Hotel Front Office Training Manual*. A.P.H Publishing Corporation.
4. R.K. Arora.(2009).*Hotel Organization And Front Office Management*. A.P.H Publishing Corporation.

Reference Books

1. Ahmed Ismail. (2004). *Front office operations And Management*. Delmar Publications.
2. Kyesung chon and Raymond. T.Sparrowe. (2001). *Welcome to Hospitality An Introduction* (2nd ed) Delmar publication.
3. G.Raghubalan, Smritee Raghubalan. (2015). *Hotel Housekeeping operations and Management*, Oxford University Press.
4. Tarachand.(2000). *Hotel and Restaurant Management*. Mohit Publications, New Delhi.
5. S.K. Bhatnagar (2005). *Front Office Management*. Frank Bros.& Co.(Publishers) Limited.
6. Ravi Aggarwal (2010). *Hotel Front Office – Systems & Procedures*, sublime publications.
7. M.A. khan.(2005).*Front Office*.Anmol Publication Private Limited.

Web Links

- <https://www.ihmnotessite.net/hotel-core-areas>
- <https://www.ihmnotessite.net/types-of-rooms>
- <https://www.ihmnotessite.net/fo-organisation>
- https://www.bharatskills.gov.in/pdf/E_Books/FrontOffice1Sem_TP.pdf
- <file:///C:/Users/Lenovo/Downloads/BHM-704ET.pdf>

Journals

1. The Journal of Hospitality & Tourism Research, Sage Publication.

Pedagogy

E-content, Lecture, Power Point Presentation, Seminar, Assignment, Group discussion.

Course Designers

- Ms. C. NIVETHA
- Ms. R. ARTHY

SEMESTER V	INTERNAL MARKS:40		EXTERNAL MARKS:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UND5SEC2P	BAKERY AND CONFECTIONARY (P)	SKILL ENHANCEMENT	2	2

Course Objectives

- To enable the students to obtain basic knowledge about bakery and confectionary.
- To learn preparation techniques of baked products.
- To develop skills in the preparation of confectionary items.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On Successful Completion of the course, students will be able to	
CO1	Identify role of equipment in bakery units	K1
CO2	Explain basic bakery preparation requirements	K2
CO3	Illustrate different types of bakery products	K2
CO4	Prepare different confectionary products	K3
CO5	Demonstrate practical application of field visit	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	-	1	3	1	3	3	2	3	-
CO2	3	-	1	3	1	3	3	2	3	-
CO3	3	-	1	3	1	3	3	2	3	-
CO4	3	-	1	3	1	3	3	2	3	-
CO5	3	-	1	3	1	3	3	2	3	-

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

List of Experiments

1. Introduction to Bakery -Role of ingredients and equipment used in bakery
2. Introduction to Confectionary -Role of ingredients and equipment used in confectionary
3. Preparation of Cake -Sponge cake, Pineapple cake, Bread-Salt Bread.
4. Preparation of Cookies - Whole wheat cookies; Biscuit- Salt biscuit.
5. Preparation of tart, pie and pastry - Fresh fruit tart, Apple pie, Vegetable Puff.
6. Preparation of Icing and frosting - Basic Butter cream, American Frosting.
7. Preparation of candied fruit, fondant and fudge- Amla candy, Marshmallow, fondant, Chocolate fudge.

Text Books

1. Kingslee, John. (2014). *Professional Text to Bakery and Confectionary*. New Age International Publishers, New Delhi.
2. Samuel A.Matz. (2008). *Bakery Technology and Engineering*. CBS Publishers.

Reference Books

1. Vij, Sneha. (2000). *Bread Basket India*. BPI (INDIA) Pvt Ltd.
2. Kingslee, John. (2014). *Professional Text to Bakery and Confectionary*. New Age International Publishers, New Delhi.
3. Parvinder S. Bali. (2018). *Theory of Bakery and Patisserie*. Oxford University Press, New Delhi

Web links

- <https://nios.ac.in/online-course-material/vocational-courses/bakery.aspx>
- https://www.fssai.gov.in/dam/jcr:22be15fc-8b41-4c4d-bf11-1c49812cd4f3/Draft_Special_Bakery_Units_Manual_English_08_11_2017.pdf
- <https://aissmschmct.in/wp-content/uploads/2020/07/Chapter1-Introduction-to-bakery-confectionery.pdf>

Pedagogy:

E-content, Lecture, Power point presentation, Seminar, Assignment, Demonstration, Visit to commercial bakery unit.

Course designers

- Ms. T.R.REVATHI
- MS. M.VINOTHINI

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (IHCYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS



M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS SYLLABUS

2023-2024 and Onwards



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS

M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS
LEARNING OUTCOME BASED CURRICULUM FRAME WORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2023-2024 onwards)

Semester II

Semester	Course	Course Title	Course Code	Inst. Hrs. /week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
II	Core Course -IV(CC)	Public Health Nutrition	23PFS2CC4	6	5	3	25	75	100
	Core Course – V (CC)	Advanced Dietetics	23PFS2CC5	6	5	3	25	75	100
	Core Choice Course -I (CCC)	A. Biochemistry and Metabolic Disorders	22PFS2CCC1A	6	4	3	25	75	100
		B. Food Quality Control and Regulations	22PFS2CCC1B						
		C. Nutrition in Clinical Critical Care	23PFS2CCC1C						
	Core Practical-II(CP)	Advanced Dietetics (P)	23PFS2CC2P	6	5	3	40	60	100
	Discipline Specific Elective Course- II (DSE)	A. Functional Foods, Nutraceuticals and Nutrigenomics	22PFS2DSE2A	6	3	3	25	75	100
		B. House Keeping and Interior Designing	22PFS2DSE2B						
		C. Food Packaging	22PFS2DSE2C						
	Internship	Internship	22PFS2INT	-	2	-	40	60	100
	Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation					
	Total			30	24				600

SEMESTER II	INTERNAL MARKS: 25			EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS	
23PFS2CC4	PUBLIC HEALTH NUTRITION	CORE	6	5	

Course Objectives

- To understand the importance of nutrition and health.
- To comprehend the nutritional status pertaining to various sectors of population.
- To gain knowledge various intervention programs.

Pre requisites

- Basic knowledge on principles of nutrition.
- Fundamentals of community nutrition.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	State basic sciences relevant to nutrition and apply public health principles to current public health related issues	K1
CO2	Interpret the nutritional status of the population making use of the different evidence- based scientific assessment methods and protocols	K2
CO3	Predict the impact of nutrition policies on the health of individual as well as population	K3
CO4	Differentiate the health and nutritional challenges encountered in different regions and understand the various strategies employed to address them	K4
CO5	Assess Nutrition Education programs for a target population using appropriate aids	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	-	3	3	3	3	3
CO2	3	3	3	3	-	3	3	3	3	3
CO3	3	3	3	3	-	3	3	3	3	3
CO4	3	3	3	3	-	3	3	3	3	3
CO5	3	3	3	3	-	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE
I	Epidemiology – Definition, aim, components, measurement in Epidemiology - IMR, NMR, MMR and tools of measurement, approach, Relation of nutrition to national development - socio-economic, industrial and agricultural development. Nutritional problems - PEM, Vitamin A Deficiency Diseases, Anaemia, Iodine Deficiency Disorders and Fluorosis, Synergism between malnutrition and infection.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Nutrition Intervention programmes in India Integrated Child Development Services (ICDS), Chief minister's breakfast scheme, Supplementary Nutrition, Bal bhog, Sakhibhog, Shishubhog; Mid-Day Meal (MDM) program; Fortification program, Poshan abhiyaan scheme, Special Nutrition Program (SNP), Balwadi Nutrition Program, Muthulakshmi Maternity Benefit Scheme for pregnant women.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	National Programs to Combat Malnutrition Iron: National Nutritional Anemia Control Program;; Vitamin A: Vitamin A Prophylaxis Program (VAPP); Iodine: National Iodine Deficiency Disorders Control Program (NIDDCP), Universal Salt Iodization (USI), Double Fortified Salt (DFS); National Deworming Campaign; Fluorosis Control Program National organization Indian Council of Agricultural Research (ICAR), Indian Council of Medical research (ICMR), National Nutrition Monitoring Bureau (NNMB), National Institute of Nutrition (NIN), Central Food and Technological Research Institute (CFTRI), Defence Food Research Laboratory (DFRL), National Institute of Public Cooperation and Child Development (NIPCCD).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	International Organizations World Bank, World Health Organization (WHO) - Sustainable development goals, United Nations International Children's Emergency Fund (UNICEF), World Food Programme (WFP), Voluntary organizations –	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	Global Alliance for Improved Nutrition (GAIN), World Alliance for Breastfeeding Action (WABA)			
V	Nutrition Assessment Direct Method -Anthropometric - Measurement of height, weight, head and chest circumferences, mid upper arm circumference, skin fold thickness, interpretation of measurements and comparison with standards (NCHS, ICMR), Biochemical parameters, Clinical examination and Dietary surveys. Indirect method - Vital Statistics – Interpretation of mortality and morbidity using biostatistics Nutrition Education Meaning, nature and importance of Nutrition education to the community and lessons to be taught. Methods of education- use of audio visual aids, Use of computers to impart nutrition education - power point presentation, E-learning, Organization of Nutrition education programmes: Principles of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Classification according to grades of malnutrition. Mission of ICDS Diarrhea Control Program. Activities of World Health Organization (WHO). Problems of nutrition education programme.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Brown Judith, E.(2008) *Nutrition*.(3rd ed.)Thomson Wadsworth USA.
2. Park, K. (2008) *Essentials of Community Health Nursing*(5th ed.).M/s Banarsidas Bhanot Publishers.Jabalpur.
3. Josephine Martin and Charlotte Beckett Oakley, (2008).*Managing Child Nutrition Programs*.(2nd ed.) Jones& Bartlett Publishers.
4. Seema Sonkar and Doreas L. Essiamah, (2008) *Food and Nutrition Security challenges towards combating malnutrition*.Chandralok Prakashan. Kanpur.
5. Bamji M.S, PrahladRao N, Reddy. (2016)*Textbook of Human Nutrition*.(4th ed.).Oxford and PBH Publishing Co. Pvt. Ltd. New Delhi.

Reference Books

1. Prakash Shetty,(2002).*Nutrition through the life cycle*.(1st ed.). Leatherhead publishing. Leather head International Ltd. UK.
2. Gibney, M.J.,Margetts, B.M.,Kearney, J.M.,Arab, L., (2004).*Public Health Nutrition*. (2nd ed.).UK.Blackwell PublishingCo.
3. Carolyn D. Berdanice., (2009), *Advanced Nutrition*, (2nd ed.). CRC Press.
4. M.Swaminathan., (2012), *Advanced Textbook on Food and Nutrition*. (2nd ed). Bangalore Printing and Publishing Co. Ltd., Bangalore,
5. Raheena Begum. M., (2015), *A textbook of Foods, Nutrition and Dietetics*.(3rd ed.).Sterling Publishers Pvt. Ltd., New Delhi.
6. Park K.,(2021), *Park's Textbook of Preventive and Social*.(26th ed.). M/S Banarasidas, Bharat Publishers, Jabalpur, India.

Web References

- <https://www.who.int/>
- <https://www.encyclopedia.com/food/encyclopedias-almanacs-transcripts-and-maps/assessment-nutritional-status>
- <https://www.fao.org/about/en/>
- <https://www.nin.res.in/downloads/NNMBREPORT2001-web.pdf>
- <https://www.icmr.gov.in/>

Journals

1. Society for Nutrition Education and Behavior, Elsevier Sci. Ltd, England
2. Journal of the Academy of Nutrition and Dietetics, Elsevier Science Inc publishing, United States.
3. Public Health Nutrition, Cambridge University, England
4. Food Research International, Elsevier Science Inc, United States.
5. Journal of Food and Agriculture, Wiley-Blackwell, England

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar, Visit to ICDS

Course Designers

- Ms. S. FATHIMA
- Ms. M. VINOTHINI

SEMESTER - II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PFS2CC5	ADVANCED DIETETICS	CORE	6	5

Course Objective

- To outline the focus of nutrition and dietetics in the prevention of diseases.
- To analyze the underlying causes, pathophysiology and complications of diseases.
- To acquire Knowledge on principles and planning therapeutic diet.

Pre requisites

- Principles of menu planning.
- Basics of therapeutic nutrition.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	State the definition, causes, symptoms and complications of various diseases and disorders	K1
CO2	Describe the principles of diet therapy, characteristics of routine hospital diets and role of diet counselling for various diseases and disorders	K2
CO3	Modify nutritional requirements and plan diet for therapeutic purposes	K3
CO4	Explain the role of dietitian in the hospital and community and interpret the importance of computer in nutrition practice.	K4
CO5	Criticize special feeding methods and drug nutrient interaction	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	2	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT I	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	a) Dietitian Definition and types of dietitians, role of dietitian in the hospital and community. b) Counseling Definition, Counsellor and Client, Classification of Counseling and techniques of counseling. c) Routine Hospital Diet and Special Feeding Methods Routine Hospital Diet -Clear fluid diet, full fluid diet, soft diet, Regular diet. Special feeding methods - Enteral nutrition and Parenteral nutrition.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	a) Diet for Febrile Conditions Pathogenesis, etiology, Metabolic changes, types of fever, symptoms, treatment and dietary modification for febrile condition - acute, chronic and recurrent fevers- typhoid, influenza, malaria, poliomyelitis, rheumatic fever, tuberculosis, HIV and Covid-19. b) Diet for Cancer -Development, etiology, metabolic alterations, symptoms, nutritional and dietary management of cancer patients, side effects of cancer treatment, role of antioxidants in cancer treatment. c) Diet for Developmental Disabilities - Down's syndrome, Cerebral Palsy, Autism and Attention Deficit Hyperactivity Disorder.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	a) Diet for Disease of Gastro Intestinal Tract Pathogenesis, etiology, types, symptoms, treatment and dietary modification for gastro intestinal disorders – Gastritis, peptic ulcer, diarrhea, dysentery, constipation, hemorrhoids, and carcinoma of the stomach. b) Diet for Biliary Tract Disorders Pathogenesis, etiology, types, symptoms and clinical findings and dietary modification for Liver disorders - Fatty liver, Hepatitis and Cirrhosis, Gall bladder disorders - Cholecystitis and Cholelithiasis. c) Diet for Pancreatic Disorders Pathogenesis, etiology, types, symptoms and clinical findings and dietary modification for Pancreatitis.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

IV	a) Diet for Obesity Etiology, energy balance, clinical manifestation, complications, dietary and lifestyle modifications and surgical management. b) Diet for Metabolic Disorders- Diabetes Mellitus Types, screening and diagnostic criteria, pathogenesis, etiology, symptoms, complications, Dietary management of Diabetes Mellitus – Food Exchange system, Glycemic Index, Glycemic Load, nutritive and non-nutritive sweeteners. Lifestyle recommendations, drugs and insulin. c) Diet for Cardio Vascular diseases - Meaning, Pathogenesis, etiology, types, symptoms, treatment and dietary modification for cardio vascular disorders –Hypo tension, hypertension, atherosclerosis, acute and chronic cardiac diseases, and congestive heart failure	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	a) Diet for Renal diseases- Pathogenesis, etiology, types, symptoms, treatment and dietary modification for renal disorders– glomerulonephritis, nephrosis, nephrosclerosis, nephrolithiasis and ureterolithiasis. Dietary modification for dialysis. b) Drug Nutrient Interaction Diet effects on drug disposition, Interactions of drugs and nutrients, Effect of drugs on food intake and absorption, Effect of nutrients on drug metabolism. c) Computers in Nutrition Practice General information – data input, data output, data analysis, data communication, clinical care – communication in patient care, Nutritional therapy.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Activities of IDA -Professional ethics and obligations of dietitian. Aetiology of HIV. Types of jaundice. Theories and grades of obesity. Causes of urinary tract infection	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Mahan, Kathleen, L., Krause's, (2004). *Food, Nutrition and Diet Therapy* (11th ed.), Pennsylvania; Saunders.
2. Antia, F. P., (2005). *Clinical Dietetics and Nutrition*, (5th ed.). Oxford University Press, New Delhi,
3. Prakash Lohar, S., (2007). *Endocrinology –Hormones and Human Health*, MJP publishers, Chennai.
4. Srilakshmi, B., (2009). *Dietetics*, (2nd ed.) New Age International Publications, New Delhi.
5. Shubhangini Joshi, A., (2014), *Nutrition and Dietetics*, (5th ed.). McGraw Hill, Education Private Limited, New Delhi.
6. Swaminathan, M., (2012). *Essentials of Food and Nutrition*, Ganesh and Company, Madras.
Maity, S. P., *Pharmacology for Second Professional Students*, (6th ed.) Books & Allied Pvt. Ltd.

Reference Books

1. Robinson, Corrine, H., (1982). *Normal and Therapeutic Nutrition*, (16th ed.). Macmillan McGraw Hill School Division, New York.
2. Udai Veer, (2007). *Elements of Food Science*, Anmol Publications Pvt Ltd, New Delhi.
3. Srilakshmi, B., (2008). *Nutrition Science*, (3rd ed.). New Age International Publications, New Delhi.
4. Indrani, T.K., (2008). *Nursing Manual of Nutrition and Therapeutic Diet*, (2nd ed.). Jaypee Brothers medical publishers (P) Ltd.
5. Mary Marian, (2008). *Clinical Nutrition for surgical patients*. Jones and Barletta Publishers.
6. Sangeetha Karnik, (2010). *Nutrition and Dietetics Therapy*, Biotech Pharma Publications, Hyderabad.

Web Links:

- <https://gpadampur.files.wordpress.com/2015/08/caft-complete-vedpal.pdf>
- <https://sfsurgery.com/wp-content/uploads/2014/06/Pancreatitis.pdf>
- <https://my.clevelandclinic.org/health/treatments/21098-tube-feeding--enteral-nutrition>
- <https://my.clevelandclinic.org/health/diseases/7104-diabetes-mellitus-an-overview>
- <https://www.mayoclinic.org/diseases-conditions/cancer/symptoms-causes/syc-20370588>

Journals

1. Food and Nutrition Bulletin, Sage Publications Inc, Japan.
2. Food and Nutrition Research, Co-Action Publishing, Sweden.
3. Food Digestion, Springer Verlag, Germany.
4. Nutrition and Cancer, Lawrence Erlbaum Associates Inc. United States
5. Nutritional Therapy and Metabolism, Wichtig Publishing, Italy.
6. Nutrition in Clinical Practice, Sage Publications Inc, United States

Pedagogy

Lecture, assignment, PowerPoint presentation, quiz, seminar, visit to hospital dietary units

Course Designers

- Ms. E. AGALYA
- Ms. N.GANGA DEVI

SEMESTER II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE	CATEGORY	HRS / WEEK	CREDITS
23PFS2CCC1C	NUTRITION IN CLINICAL CRITICAL CARE	CORE CHOICE	6	4

Course Objectives

- To understand the special nutritional requirements in critically ill.
- To know the nutritional support system for critically ill.
- To ensure the nutritional needs of the critically ill patient

Pre requisites

- Fundamentals on nutrition.
- Basic knowledge on principles of dietary management.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Label the nutritional assessment methods	K1
CO 2	Explain the principles of nutritional care	K2
CO 3	Predict the nutritional status of critically ill patients	K3
CO 4	Associate importance of enteral and parenteral nutrition	K4
CO 5	Determine role of nutrients in critical care	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	2	2
CO2	3	3	3	3	2	3	3	3	2	2
CO3	3	3	3	3	2	3	3	3	2	2
CO4	3	3	3	3	2	3	3	3	2	2
CO5	3	3	3	3	2	3	3	3	2	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Screening and Nutritional Assessment of Critically Ill Patients a. Screening: Diagnosis of malnutrition, Nutrition screening, Methods for nutritional screening Malnutrition Universal Screening Tool, Nutritional Risk Screening, Mini Nutritional Assessment. b. Assessment of Nutritional Status: Direct and Indirect methods, Anthropometric Assessment - Body Mass Index, Mid Arm Circumference, Triceps skin fold thickness; Biochemical assessment; Clinical assessment – temperature, Blood Pressure, Pulse Rate; Dietary assessment – 24-hour recall method, food frequency questionnaires.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1, K2, K3, K4, K5
II	Nutritional Care for Hospitalized Patients a. Principles of nutrition care – Nutrition care process, Progressive diets- Clear fluid diet, full fluid diet, soft diet, mechanical soft diet and regular diet. b. Surgical Conditions- Hormonal response during surgery, levels of stress, starvation, sepsis, Infections, pre operative diet, post operative diet.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
III	Special Feeding Methods a. Enteral nutrition – Types, routes, mode of feeding, importance and procedure, advantages and disadvantages of home-based feed, precautions while feeding and complications. b. Parenteral nutrition – Types, composition, procedure, importance of total parenteral nutrition, precautions while feeding and complications. Refeeding syndrome and clinical manifestations of refeeding syndrome.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
IV	Nutritional Support for Burn and Trauma a. Burns – Principles of nutrition management, mode of feeding, Clinical effects of malnutrition and factors affecting nutritional requirements in burn patients. b. Trauma – Classification, Principles of nutrition management, timing and route of feeding, Clinical effects of malnutrition and factors affecting nutritional requirements in trauma patients.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5

V	Nutritional Support for Renal, Hepatic, Pulmonary and Cancer a. Renal failure –types, metabolic aspects and nutritional requirement, effects of renal treatment on nutrition and nutritional therapy. b. Hepatic failure – Consequences of hepatic failure upon nutritional status and nutritional support. c. Pulmonary diseases – Types, effects of pulmonary treatment on nutrition and nutritional support. d. Cancer – Treatment – surgery, chemotherapy, radiation, combination and its effect on nutritional status.	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Classification of Malnutrition. Guidelines for Pre operative diet in surgical condition Comparison of enteral and parenteral nutrition. Classification of burns. Types of hepatic failure.	-	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5

Textbooks

1. Luc Cynober A, Frederick Moore A., (2003), *Nutrition and Critical Care*, Karger Medical and Scientific Publishers.
2. Khanna K, Gupta S, Seth R, Passi SJ, Mahna R, Puri S., (2013), *Textbook of Nutrition and Dietetics*, Phoenix Publishing House Pvt Ltd.
2. Frederick A. Moore, Edward Abraham., (2017), *Textbook of Critical Care*, Elsevier

Reference Books

1. Verma P K., (2008), *Principles and Practice of Critical Care*, B. I Publications.
2. Pierre Singer., (2013), *Nutrition in Intensive Care Medicine: Beyond Physiology*, Karger Medical and Scientific Publishers.
3. Peter Faber, Mario Siervo., (2014), *Nutrition and Critical Care*, Cambridge University Press.
4. Rajkumar Rajendram, Victor R. Preedy, Vinood B. Patel., (2015), *Diet and Nutrition in Critical Care*, Springer New York.
5. Gail A. Cresc., (2016), *Nutrition Support for critically ill patient*, CRC Press.

Journals

1. Journal, Indian Academy of Clinical Medicine, Med IND, India.
2. Journal of the American Academy of PAs, Wolters Kluwer, United States

Web References

1. <https://www.slhd.nsw.gov.au/rpa/neonatal%5Ccontent/pdf/guidelines/tpn.pdf>
2. [https://www.clinicalnutritionjournal.com/article/S0261-5614\(20\)30194-1/fulltext](https://www.clinicalnutritionjournal.com/article/S0261-5614(20)30194-1/fulltext)
3. https://www.researchgate.net/publication/244829589_Basics_in_Clinical_Nutrition_Nutritional_support_in_trauma
4. https://nutritionguide.pcrm.org/nutritionguide/view/Nutrition_Guide_for_Clinicians/1342058/all/Burns
5. <https://www.nutritioncaresystems.com/chronic-obstructive-pulmonary-disease/>
6. <https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-pdq>

Pedagogy:

E-content, Lecture, Powerpoint presentation, Seminar, Assignment

Course Designers

- Ms. M. VINOTHINI
- Ms. C. NIVETHA

SEMESTER II	INTERNAL MARKS: 40		EXTERNAL MARKS: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
23PFS2CC2P	ADVANCED DIETETICS (P)	CORE PRACTICAL	6	5

Course Objective

- To understand the modification of normal diet for therapeutic purpose.
- To acquire the skills of preparing diet for various disease conditions.
- To study the importance of dietitian in hospitals.

Pre requisites

- Application of dietary principles.
- Planning and preparation of modified diet.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Recall the importance of therapeutic nutrition	K1
CO2	Illustrate foods to be included and avoided in the treatment of diseases	K2
CO3	Predict the dietary principles in the management of diseases	K3
CO4	Analyse the various disease conditions and prepare menu according to it	K4
CO5	Appraise the developed tools for diet counseling of all conditions.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	2	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

1. Preparation of clear liquid, full liquid and soft diet.
2. Planning and preparing diets for
 - Febrile Conditions –Acute, Intermittent and Chronic
 - Cancer of oral cancer, gastrointestinal tract and cancer cachexia
 - Gastrointestinal disorders – Peptic ulcer, Diarrhea and Constipation.
 - Liver disorders - Hepatitis and Cirrhosis
 - Metabolic disorders – Diabetes mellitus and Obesity
 - Cardio vascular disorders – Sodium restricted diet (Low, moderate, restricted) Hypertension and Atherosclerosis.
 - Renal disorders – Acute Renal Failure, Chronic Renal failure and Renal stones.
3. Diet counseling for
 - Febrile Conditions
 - Gastrointestinal disorders
 - Liver disorders
 - Metabolic disorders
 - Cardio vascular disorders
 - Renal disorders

Text Books

1. Mahan Kathleen L. (2004). Krause's Food, Nutrition and Diet, Therapy, Pennsylvania Saunders
2. Srilakshmi,B. (2009). Dietetics. New Age International Publications, New Delhi.

Reference Books

1. Indrani.T.K. (2008). Nursing Manual of Nutrition and Therapeutic Diet. Jaypee Brothers Medical Publishers Pvt.Ltd.
2. Sangeetha Karnik. (2010). Nutrition and Dietetics Therapy. Biotech Pharma Publications, Hyderabad.

Pedagogy

Lecture, Demonstration, Practical, E-content.

Course designers

- Ms.E.AGALYA
- Ms.N.GANGA DEVI

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (IHCYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS



M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS SYLLABUS

2022-2023 and Onwards



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS

M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS

LEARNING OUTCOME BASED CURRICULUM FRAME WORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester IV

Semester	Course	Course Title	Course Code	Inst. Hrs. /week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
IV	Core Course– VIII (CC)	Quantity Food Production and Service	22PFS4CC8	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. Management and Accounting in Hospitality Industry	22PFS4CCC3A	6	4	3	25	75	100
		B. Techniques in Food Analysis	22PFS4CCC3B						
		C. Dietary Compliance and Counselling Skills	22PFS4CCC3C						
	Core Practical - IV (CP)	Quantity Food Production and Service (P)	22PFS4CC4P	6	5	3	40	60	100
	Generic Elective Course-II (GEC))	Community Nutrition	22PFS4GEC2	3	2	3	25	75	100
	Project	Project Work	22PFS4PW	9	5	-	-	100	100
	Total			30	21				500
	Grand Total			120	92				2200

SEMESTER IV	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4CC8	QUANTITY FOOD PRODUCTION AND SERVICE	CORE	6	5

Course Objectives

- To gain knowledge on types of menus and menu planning.
- To learn the process of production cycle activities.
- To understand the importance of hygiene and sanitation.

Pre requisites

- Basic knowledge on food service management.
- Fundamentals of food production

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define menu planning, standardization, purchase, inventory, storage and food service.	K1
CO2	Illustrate menu, styles of food service, food service systems and kitchen organization.	K2
CO3	Compute the principles of purchasing, receiving, storage and techniques in pre-preparations.	K3
CO4	Infer standardization of recipes, portioning, production, work simplification and sanitation.	K4
CO5	Assess the techniques in food storage, management of food production, réchauffé, fuel, and maintenance of equipments.	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	3	3
CO2	3	3	3	2	3	3	3	2	3	3
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	3	3	2	3	3	3	2	3	3
CO5	3	3	3	2	3	3	3	2	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Menu planning, standardization of recipes and Production a) Menu planning - definition, types of menu, techniques of writing a menu, menu display, study of menus for different types of quantity food outlets, courses of menu – french classical menu, uses of menu cards, important cookery terms used in menus, common terms in french and english menu, role of computers in menu planning. b) Standardization of recipe and portioning- methods and benefits. left over utilization of foods. c) Production- volume feeding- institutional and industrial catering, off premises catering, other catering establishments.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
II	Purchase, Receiving and Storage a) Indenting, Methods of buying (Informal, formal, bid, negotiation, future contracts), purchasing procedures, standard purchase specifications, methods of purchasing (contract purchasing, purchasing through quotations, cash purchases, purchasing through tenders, centralized purchases, periodical purchases), receiving of purchased items. b) Receiving- Delivery types, delivery procedures and receiving procedure. c) Storage – Perishable, Non-perishable, principles of storage (FIFO, LIFO, Bin cards), recommended temperatures for storage and inventory control.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
III	Food Service system and Styles of service a) Food service systems-Types- Conventional, Commissary, Ready prepared (cook-chill, cook- freeze) and Assembly service system. b) Styles of services (English Service, American Service, French Service, Gueridon Service, Russian Service). Types of services (Waiter service, Banquet service, Buffet service, Self- service), rules for laying a table, rules for waiting at a table.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
IV	Kitchen organization, Fuel, Work Simplification and Equipment a) Kitchen Organization - kitchen layout – Island layout, zonal layout, assembly layout. Points to be considered while designing kitchen layout. b) Fuel- Types of fuels, management and effective utilization of fuel. c) Work Simplification –Aspects and classification of work simplification. Mise-en –scene, Mise- en-place.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5

	d)Equipment – Classification, Traditional Vs Modern equipment. Equipment required for quantity food production – major and minor with reference to receiving, storage, preparation, service, dish washing and garbage disposal area. Use, care and maintenance of equipment.			
V	Safety, Hygiene and Sanitation a)Safety- Causes of accidents in food industry, Three Es of safety, Safety procedures, First aid, Fire accident - types, prevention and control, pest control, Work environment safety, safety management programmes. b)Hygiene and Sanitation – Environmental hygiene and sanitation, hygiene in food handling, personnel hygiene.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Preliminary techniques in food production. Advantages of purchases in food industry. Equipment in service area - (silver, crockery, glassware, stainless steel, plastics and melamine ware). Ways to improve fuel consumption in kitchen. Effective sanitation approaches in food industry.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Negi J. (2014). *Professional Hotel Management*. S. Chand and Company Limited, New Delhi.
2. Palacio JP. Harger V. Shugari G. (2001). *West and Woods Introduction to Food Service*. Mac Millan Pub Co., New York.
3. Krishna Arora (2008). *Theory of cookery*. Fronk Bros and co. Publishers, New Delhi
4. Vijay Dhawan (2018). *Food & Beverage Service*. Frank Bros & co, New Delhi.
5. Singaravelavan R.(2018). *Food & Beverage Service*. Oxford University press. New Delhi.
6. Cessarani V. Kinton R., (2004). *Practical Cookery*. 10th ed. Hodder and Stoughton publishers.
7. Thangam Philip (2005). *Modern Cookery*. 3rd ed. Orient Longmam Limited.
8. Sethi M. and Malhan S.M. (20018). *Catering Management- An Integrated Approach*. 3rd ed. Wiley Eastern Limited, Mumbai.

Reference Books

1. Khan MA.(2003). *Food Service Operations*.AVI Publications Co., Connecticut.
2. Tharun Bansal (2015). *Hotel Facility Planning*, Oxford University Press
3. Pearson. (2016) *Principles and Practices*. 13th ed. Pub. Harlow:.
4. John B. Knight, Lendal H. Kotschevar. (2017) 3rd ed. *Quantity: food Production, Planning and Management*, John Wiley and Sons,.
5. Parvinder S Bali.(2012). *International Cuisine and Food Production Management*. Oxford. New Delhi.

Web links

- <https://blog.cvent.com/events/food-service-styles/>
- <https://www.nidirect.gov.uk/articles/storing-food-safely>
- <http://www.breakingtravelnews.com/focus/article/different-types-of-cuisines-around-the-world-come-with-us-and-enjoy-the-exp/>
- <https://opentextbc.ca/foodsafety/chapter/storage-temperatures-and-procedures/>
http://www.searo.who.int/entity/world_health_day/2015/whd-what-you-should-know/en/

Journals

1. Journal of Foodservice Business Research, Haworth Press Inc. publishing, United States
2. Food Hygiene and Safety Science, Food Hygiene & Safety publishing, Japan.
3. Food, Culture & Society, Association for The Study of Food and Society publishing, United States.
4. Manufacturing and Service Operations Management, Institute for Operations Research and The Management Sciences publisher, United States.

Pedagogy: Lecture, Seminar, Assignment, Power point presentation, Industrial visits.

Course Designers

- Ms. E. AGALYA
- Ms. T. R. REVATHI

SEMESTER IV	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4CCC3A	MANAGEMENT AND ACCOUNTING IN HOSPITALITY INDUSTRY	CORE CHOICE	6	4

Course Objectives

- To understand the forms and practices adopted in hospitality industry
- To gain knowledge on the various sources of finance.
- To learn various marketing procedures.

Pre requisites

- Basic principles of management
- Fundamentals of accounting

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the management and importance of hospitality management	K1
CO2.	Explain the scope of hospitality industry	K2
CO3.	Apply the basic strategies involved in marketing	K3
CO4.	Analyse financial statements by using basic accounting techniques	K4
CO5.	Assess the types of various records used in front office area	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	2	3	2	3	2
CO2	3	3	3	2	3	2	3	2	3	2
CO3	3	3	3	2	3	2	3	2	3	2
CO4	3	3	3	2	3	2	3	2	3	2
CO5	3	3	3	2	3	2	3	2	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Management Accounting Definition, need and importance of management accounting, cost accounting, difference between management accounting and cost accounting, working capital management, importance of working capital management, Total Quality Management in hospitality industry.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
II	Hospitality marketing and marketing communication Definition of sales and marketing, marketing activities, relationship between sales and marketing, elements of marketing, role of sales department. Marketing communication, media analysis, public relations, press releases, market research and planning, supply and demand.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
III	Basic Accounting Sources of Finance- classification, need for accounting, cash flow analysis, book-keeping and accounting, single entry book keeping system, double- entry system, journal- sub divisions of journal, ledger, trial balance, balance sheet, cashbook –profit and loss account, accrual accounting, cash basis accounting, depreciation and amortization, profitability ratios, liquidity ratios, leverage ratios, budgetary control.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
IV	Front office accounting and Automation in Hospitality Industry Guest accounting, non guest accounting, main function of accounts and its system, types of folios and accounts maintained by the front office cashier, front office accounting cycle, types of postings, methods of handling guest accounts, methods of	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5

	account settlements. Automation in Hospitality Industry-Advantages of using computers in food service institutions, Record keeping systems. Point of sale (POS) and Property Management Systems (PMS).			
V	Food and Beverage Cost control Food and Beverage cost, cost analysis, cost control methods, market reports, inventory control, food and beverage cost reconciliation – ingredient control, preparation control, beverage control techniques, waste reduction and sustainability	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Types of costs. Activities of marketing and sales team in hospitality industry. Petty cash book. Benefits of property management system. Pillars of sustainability in hospitality industry.	-	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5

Text Books

1. L.Dennis Foster. (1993). *Food and Beverage: Methods and Cost controls*. McGraw – Hill International Editions, United States
2. Paul R. Dittmer. (2002). *Dimensions of the hospitality industry*. John Wiley and Sons Inc.

Reference Books

1. A.Murthy and S. Gurusamy.(2008). *Essentials of Management Accounting*. McGraw – Hill International Editions, United States
2. RajniSofat and PreetiHird. (2008). *Basic Accounting*. Prentice Hall of India Pvt.Ltd.
3. S.K.Bhatnagar. (2005). *Front Office Management*. Frank Bros and Co.

Web links

- <https://www.investopedia.com>
- https://link.springer.com/chapter/10.1057/9780230353275_19
- <https://www.toppr.com/guides/business-environment/business-functions/financial-management>

Journals

1. Journal of Management Accounting Research, Chapel Hill, USA
2. Journal of Accounting Research, Accounting Research Centre, University of Chicago

Pedagogy:

Lecture, Power point presentation, Seminar, Assignment.

Course Designers

- Ms.M.VINOTHINI
- Ms.C.NIVETHA

SEMESTER -IV	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4CCC3B	TECHNIQUES IN FOOD ANALYSIS	CORE CHOICE	6	4

Course Objectives

- To understand the types of instruments available for food analysis.
- To acquire knowledge on the methods used for food analysis.
- To understand the functioning of instruments.

Pre requisites

- Basic skills on the quantification technique of various components.
- Principle and instrumentation used in food quality analysis.

Course Outcome and Cognitive Level Mapping

CO Number	CO statement	Cognitive level
	On the successful completion of the course, students will be able to:	
CO 1	Identify the knowledge obtained to choose the appropriate instrument and technique for food analysis	K1
CO 2	Explain the role of chromatography and spectrometry in food analysis	K2
CO 3	Predict the importance of advanced chromatography and electrophoresis techniques	K3
CO 4	Infer the usage of various analytical techniques for quality of food analysis.	K4
CO 5	Evaluate the methods and types of radioactive isotopes and their functions.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	1	3	2	2	2	-
CO2	3	2	3	2	1	3	2	2	2	-
CO3	3	2	3	2	1	3	2	2	2	-
CO4	3	2	3	2	1	3	2	2	2	-
CO5	3	2	3	2	1	3	2	2	2	-

“1” – Slight (Low) Correlation → “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation → “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to food analysis: Objectives, need, laboratory rules, criteria for selection techniques of food analysis, Basic Instrumentation – principles, importance and application of pH meter, Dialysis, ultra filtration, Reverse osmosis, Centrifugation, chromatography, calorimetry, moisture analyser, particle size analyser, dryers, Densimetry, Texture profile analysis.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
II	Chromatographic Technique: Components, Principle, Schematic diagram, applications of paper, thin layer, partition chromatography, Advance Chromatography-Gas chromatography, High Performance Liquid Chromatography (HPLC), Thin Layer Chromatography (TLC), High Performance Thin Layer Chromatography (HPTLC). Electrophoresis: Paper & gel electrophoresis, PAGE, iso-electric, 2D electrophoresis, Immuno electrophoresis.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
III	Spectroscopic Technique – Components, Principle, Schematic diagram, applications of UV-Visible Spectroscopy, Atomic-Absorption Spectroscopy (AAS), Nuclear Magnetic Resonance Spectroscopy (NMR), Fourier Transform Infrared Spectroscopy (FTIR), Mass spectrometry.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
IV	Advance Method of Analysis Components, Principle, Schematic diagram, applications of Nuclear magnetic resonance (NMR) spectroscopy, Enzyme-linked immunosorbent assay (ELISA) LFD (lateral flow device) , Differential Thermal Analysis (DTA) ,Differential Scanning Calorimetry (DSC) , Radioactive isotopes, X- Ray Diffraction (XRD)	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

V	Application in Quantitative Food Analysis – Carbohydrates – Phenol Sulfuric acid method, Protein – Kjeldhal Nitrogen method, Fat - Soxhlet, Vitamins – analysis of fat soluble vitamins by UHPLC using UV detection, Minerals, Sugars, Food Additives- Determination of Fat in Cereals and Cereal-based Products by Randall Extraction- Method and Toxic Substances	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Principles of Hot air oven, Types of Liquid Chromatography, Importance of UV-Visible Spectroscopy Types of Radioactive isotopes Application in Quantitative Food Analysis -fat soluble vitamins	-	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5

Text Books

1. Semih Otles. (2016). *Handbook of Food Analysis Instruments*. CRC Press, Bangalore
2. Suzanne Nielsen. (2014). 4th ed. *Food Analysis*. Springer Science & Business Media.
3. Kaur. N. (2021). 3rd ed. *Instrumental methods of chemical analysis*. Pragati Prakashan Educational Publishing. Garhwal
3. S.M Knopkar. (2013) *Basic concepts of Analytical Chemistry*. New Age International (P) Ltd., Publishers. New Delhi.

Reference Books

1. Dr R.S. Khandpur. (2007) 2nd ed. *Handbook of Analytical Instruments*. Tata McGraw-Hill Education.
2. Semih Otles, (2011). 2nd ed. *Methods of Analysis of Food Components and Additives*. CRC Press, Bangalore.

Web links

- <https://egyankosh.ac.in/bitstream/123456789/12395/1/Unit-13.pdf>
- <https://www.omicsonline.org/scholarly/food-analytical-chemistry-journals-articles-ppts-list.php>

Journals

1. Journal of Food Composition and Analysis, Elsevier, University of Reading, Reading, UK.
2. Journal of Food Science and Technology, Association of Food Scientists and Technologists of India, Mysuru, Karnataka.

Pedagogy

Lecture, Assignment, PowerPoint presentation, Quiz, Seminar, E-content, Industrial Visit.

Course designers

- Ms.T.R. REVATHI
- Ms.N.GANGA DEVI

SEMESTER IV	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4CCC3C	DIETARY COMPLIANCE AND COUNSELLING SKILLS	CORE CHOICE	6	4

Objectives

- To acquire knowledge on basic etiquette of a counsellor.
- To handle different areas of counselling.
- To gain knowledge on counselling process.

Pre requisites

- Fundamental knowledge on dietary principles.
- Basic knowledge in growth and developmental stages of life cycle.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify the psychology and nutritional status of client	K1
CO2.	Explain communication skills for various groups	K2
CO3.	Apply counselling techniques as per the needs of various groups	K3
CO4.	Determine the sources of counselling data	K4
CO5.	Evaluate the impact of counselling	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	2	3	2	3	2
CO2	3	3	3	2	3	2	3	2	3	2
CO3	3	3	3	2	3	2	3	2	3	2
CO4	3	3	3	2	3	2	3	2	3	2
CO5	3	3	3	2	3	2	3	2	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Basics in Counselling Definition, Goals, Ethics, Scope, Characteristics of counsellor, types of counselling, objectives of counselling in health care, tools of counselling, sources of counselling, e - resources in counselling. Role of a Dietician -Role of a dietician in a hospital and community, team approach to nutritional care, ethical code and responsibility. Defining features of counselling psychology.	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5
II	Communication for counselling: Concepts and principles in communication and their application in developing skills in counseling. Use of communication aids, communication and interviewing skills. Strategies and communication skills, Rapport building and opening techniques, Questioning, listening, reflecting, acceptance, silence, leading reassurance, non-verbal behavior, terminating skills.	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5
III	Process of Counselling Techniques for obtaining relevant information, Clinical Information, Medical History and General Profile, Dietary Diagnosis -Assessing food and nutrient intakes, Lifestyles, physical activity, stress, Nutritional Status, correlating relevant information and identifying areas of need: Problem exploration and clarification, Developing new perspectives and setting goals, implementation, follow up and evaluation.	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5
IV	Working with different groups Hospitalized patients (adults, pediatric, elderly, special needs,), adjusting and adapting to individual needs. Outpatients (adults, pediatric, elderly and special needs), techniques and modes.	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5
V	Various Therapeutic Techniques Psychoanalytic therapy, group therapy, psychodrama, behavior therapy, Cognitive therapy. Nutrition counselling protocols- Involving phase, Exploration and education, resolving, closing. Exploring the expressions, use of art in therapy.	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Psychological assessment and testing procedure. Non-verbal communication aid. Social support agencies. Care takers education Gestalt therapy	-	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5

Text books

1. Sujata Sriram. (2016). *Counselling in India Reflection on the process*. Springer, Singapore.
2. Susan Davison. etal. (2013). *Clinical Counselling in Medical Settings*. Taylor and Francis, London.
3. Shubhangini A. Joshi. (2011). *Nutrition and Dietetics*, 3rd edition, Tata McGraw Hill Education private limited, New Delhi.
4. Srilakshmi B. (2010). *Dietetics*, New Age International Publishers, New Delhi.

Reference books

1. Kathleen D. etal. (2016). *Nutrition Counseling and Education Skill Development*. Cengage L Earning, United States of America.
2. Judy Gable. Tamara Herrmann. (2016). *Counselling Skills for Dietitians*. 3rd ed Blackwell Publishing, Singapore.

Web links

- <https://learn.microsoft.com/en-us/microsoft-365/community/principles-of-communication>
- <https://www.mhinnovation.net/PMHP-Basic-Counselling-Skills.pdf>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6351246/>

Journals

1. Journal of Counselling Psychology, American Psychological Association, America.
2. British Journal of Guidance and Counselling, Taylor and Francis, United Kingdom
3. British Journal of Occupational Therapy, Sage Publication, United States.
4. Counselling and Psycotherapy research, Wiley online Library, United Kingdom.

Pedagogy:

E-content, Lecture, Power point presentation, Seminar, Assignment.

Course Designers

- Ms.S.FATHIMA
- Ms.E.AGALYA

SEMESTER IV	INTERNAL MARKS: 40		EXTERNAL MARKS:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4CC4P	QUANTITY FOOD PRODUCTION AND SERVICE (P)	CORE PRACTICAL	6	5

Course Objectives

- To gain knowledge in menu planning and product standards to maintain quality.
- To learn aspects on quantity production and quality control.
- To understand the importance of styles of services and courses of menu.

Pre requisites

- Principles of menu planning .
- Basic skills in food production.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Identify the menu, table setting and napkin folding and production area.	K1
CO 2	Explain standardization of recipes, portion control and napkin folding.	K2
CO 3	Illustrate the courses of menu, napkin folding and layout.	K3
CO 4	Infer the role of ingredients in various regional cuisines	K4
CO 5	Evaluate different cuisines and techniques in layout for different production area.	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	3	3
CO2	3	3	3	2	3	3	3	2	3	3
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	3	3	2	3	3	3	2	3	3
CO5	3	3	3	2	3	3	3	2	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

List of Experiments

1. Standardization of recipes, Portion control and Pricing.
2. Table Setting and Napkin folding.
3. Planning and Preparation sauce, soup and salad.
4. Planning and Preparation of Continental cuisines.
5. Planning and Preparation of Western cuisine
6. Planning and Preparation of South Indian cuisine
7. Planning and Preparation of North Indian cuisine
8. Planning and Preparation of Chinese cuisine
9. Planning and Preparation of Thai cuisine.
10. Plan and design a layout for small, medium and large production area.

Text Books

1. Negi J. (2014). *Professional Hotel Management*. S. Chand and Company Limited, New Delhi.
2. Palacio JP. Harger V. Shugari G. (2001). *West and Woods Introduction to Food Service*. Mac Millan Pub Co., New York.
3. Krishna Arora (2008). *Theory of cookery*. Fronk Bros and co. Publishers, New Delhi
4. Vijay Dhawan (2018). *Food & Beverage Service*. Frank Bros & co, New Delhi.
5. Singaravelavan R.(2018). *Food & Beverage Service*. Oxford University press. New Delhi.
6. Cessarani V. Kinton R., (2004). *Practical Cookery*. 10th ed. Hodder and Stoughton publishers.
7. Thangam Philip (2005). *Modern Cookery*. 3rd ed. Orient Longmam Limited.
8. Sethi M. and Malhan S.M. (20018). *Catering Management- An Integrated Approach*. 3rd ed. Wiley Eastern Limited, Mumbai.

Reference Books

1. Khan MA.(2003). *Food Service Operations*.AVI Publications Co., Connecticut.
2. Tharun Bansal (2015). *Hotel Facility Planning*, Oxford University Press
3. Pearson. (2016) *Principles and Practices*. 13th ed. Pub. Harlow:.
4. John B. Knight, Lendal H. Kotschevar. (2017) 3rd ed. *Quantity: food Production, Planning and Management*, John Wiley and Sons,.
5. Parvinder S Bali.(2012). *International Cuisine and Food Production Management*. Oxford. New Delhi.

Pedagogy:

Lecture, Demonstration, Practical, ICT tools, Industrial visits.

Course Designers

Ms.T.R.REVATHI

Ms. E.AGALYA

SEMESTER III	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4GEC2	COMMUNITY NUTRITION	GENERIC ELECTIVE	3	2

Course Objectives

- To provide information regarding nutritional assessment
- To enable students to impart nutrition education among rural and needy people.
- To acquaint them knowledge regarding national and international program running in the field of community nutrition

Pre-requisites

- Fundamentals of community nutrition.
- Basic knowledge on nutrition intervention programmes.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On Successful Completion of the course, students will be able to	
CO1	State the interrelationship between health and nutrition and list role of community nutritionist in public health care system.	K1
CO2	Illustrate the assessment methods of nutritional status and nutrition education.	K2
CO3	Apply the significance of nutritional care for different age groups in community.	K3
CO4	Determine prevalence, causes, consequences and prevention of common nutritional problems in India.	K4
CO5	Assess the role of nutrition education for the community.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	1	1	2	-	2	1	-	1	1
CO2	2	1	1	2	-	2	1	-	1	1
CO3	2	1	1	2	-	2	1	-	1	1
CO4	2	1	1	2	-	2	1	-	1	1
CO5	2	1	1	2	-	2	1	-	1	1

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Nutrition and health Relationship between health and nutrition, Malnutrition-Definition, Causes, Consequences, Poverty -disease cycle, role of community nutritionist in public health care system	9	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4,K5
II	Nutritional problem in India Prevalence, causes, consequences and prevention of common nutritional problems in India: Protein Energy Malnutrition (PEM), Severe Acute Malnutrition (SAM), Anemia, Vitamin A deficiency disorder, Iodine deficiency disorder, Fluorosis.	9	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
III	Assessment of nutritional status Anthropometry Assessment, Biochemical Assessment, Clinical Examination and Dietary Assessment	9	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
IV	Nutritional Care for different age groups in Community – Pregnancy, lactation, infants, pre-school, school going, adult and old age	9	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
V	Nutrition education Definition, Need and Scope, Importance and Process of Nutrition education, Methods used in Nutrition education- Individual, Group, Mass Approach, Nutrition education aids/tools, Role of computer and computer applications in Nutrition education.	9	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4,K5
VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Comparison of Under nutrition and over nutrition , Symptoms of Anaemia, Dietary assessment -Food weighment method, Role of nutrition intervention programmes, Application of education modules in nutrition intervention	-	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4,K5

Text Books

1. Srilakshmi B, Suganthi V. (2023). *Community Nutrition*. New age International (P) Ltd., Publishers, New Delhi.
2. Bamji .M.S, Prahlad Rao.N, Reddy V (2016). *Textbook of Human Nutrition*. Oxford and PBH Publishing Co. Pvt. Ltd, New Delhi.
3. Park K (2011). *Park's Textbook of Preventive and Social Medicine*, 21st Edition. M/s Banarasidas Bhanot Publishers. Jabalpur. India
4. Wadhwa A and Sharma S (2003). *Nutrition in the Community- A textbook*. Elite Publishing House Pvt. Ltd. New Delhi.
5. Swaminathan. M. (2014). *Advanced Textbook of Food and Nutrition*. The Bangalore Printing and Publishing Co. Ltd. Bangalore.

Reference Books

1. Suryatapa Das. (2023). *Textbook of community Nutrition*, Academic Publishers, Kolkata.
2. M. Margaret Barth Ronny A Bell Karen Grimmer (2021). *Public Health Nutrition, Rural Urban and Global based practice*. Springer Publishing Company, UK

Web links

- <https://egyankosh.ac.in/bitstream/123456789/33444/1/Unit-15.pdf>
- <https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=318&printable=1>
- <https://egyankosh.ac.in/bitstream/123456789/75045/3/Unit-7.pdf>
- <https://www.fao.org/3/i9940en/I9940EN.pdf>

Journals

1. International Journal of Public Health and Nutrition, Cambridge University press, UK.
2. Indian Journal of Health and Wellbeing, Indian Association of Health, Research and Welfare, Hisar, Haryana.

Pedagogy

Lecture, Assignment, PowerPoint presentation, quiz, seminar, E-Content.

Course Designers

Dr..B.THANUJA

Ms. N.GANGA DEVI

SEMESTER IV	INTERNAL MARKS: -		EXTERNAL MARKS:100	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS4PW	PROJECT WORK	PROJECT	9	5

Objectives

- To Design the framework to collect data.
- To develop the ability to solve a specific research problem.
- To understand the importance of experimental analysis.

Prerequisites

- Fundamentals of research
- Basic knowledge on computer applications

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the research design	K1
CO2.	Describe research problem	K2
CO3.	Classify collected data	K3
CO4.	Examine collected data and associate with statistical tool	K4
CO5.	Assess and publish papers in reputed research journals	K5

Mapping of CO with PO and PSO

COs	PSO 1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	2	3	2	3	2
CO2	3	3	3	2	3	2	3	2	3	2
CO3	3	3	3	2	3	2	3	2	3	2
CO4	3	3	3	2	3	2	3	2	3	2
CO5	3	3	3	2	3	2	3	2	3	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

- Principles of research ethics
- Selection of research problem
- Formulation of research design and methodology
- Collection of review of literature
- Processing of data – editing, coding, classification and tabulation
- Analysis of data
- Deriving solution and conclusion
- Preparation of bibliography
- Publication in journals
- Checking of plagiarism
- Preparation of proposals for research projects

Course Designers

- Ms. M. VINOTHINI
- Ms. R. ARTHY

ANNEXURE P

ANNEXURE P

Matters relating to the Controller of Examinations

- a. Ratification of the Internal and External marks for the practical courses for (2023-2024) batch and onwards
- b. Conduct of End Semester Examinations and the Declaration of Result

Ratification of UG, PG Internal External Practical Marks for 2023-2024 Batch and onwards

Internal : 40

External: 60

Internal : 40	
Record	10
Observation	5
Continuous Performance	10
Test	15
Total	40

- b. Conduct of End Semester Examinations and the Declaration of Result of November 2023*

(P.T.O)

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY - 18

END SEMESTER EXAMINATION – NOVEMBER 2023

RESULT ANALYSIS BEFORE REVALUATION

I UG

S.NO.	DEPARTMENT	SEM	NUMBER REGISTERED	NUMBER APPEARED	NUMBER OF PASS	PASS PERCENTAGE
1	TAMIL	I	21	21	16	76.19
2	ENGLISH	I	30	30	24	80
3	BSW	I	12	12	9	75
4	BBA	I	49	49	39	79.59
5	B.COM	I	193	193	148	76.68
6	B.COM (CA)	I	66	66	58	87.88
7	MATHEMATICS	I	18	18	15	83.33
8	PHYSICS	I	15	15	12	80
9	CHEMISTRY	I	21	21	17	80.95
10	MICROBIOLOGY	I	72	72	69	95.83
11	BIOTECHNOLOGY	I	68	68	60	88.24
12	COMPUTER SCIENCE	I	137	137	103	75.18
13	COMPUTER APPLICATIONS	I	89	89	87	97.75
14	INFORMATION TECHNOLOGY	I	51	51	43	84.31
15	NUTRITION & DIETETICS	I	31	31	27	87.10
16	COGNITIVE SYSTEMS	I	53	53	50	94.34

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY - 18

END SEMESTER EXAMINATION – NOVEMBER 2023

RESULT ANALYSIS BEFORE REVALUATION

II UG

S.NO.	DEPARTMENT	SEM	NUMBER REGISTERED	NUMBER APPEARED	NUMBER OF PASS	PASS PERCENTAGE
1	TAMIL	III	25	25	22	88
2	ENGLISH	III	31	31	30	96.77
3	BSW	III	23	23	21	91.30
4	BBA	III	64	64	56	87.5
5	B.COM	III	250	250	225	90
6	B.COM (CA)	III	69	69	65	94.20
7	MATHEMATICS	III	27	27	24	88.88
8	PHYSICS	III	30	30	26	86.67
9	CHEMISTRY	III	38	38	27	71.05
10	MICROBIOLOGY	III	68	68	66	97.06
11	BIOTECHNOLOGY	III	66	66	62	93.94
12	COMPUTER SCIENCE	III	148	148	134	90.54
13	COMPUTER APPLICATIONS	III	94	94	91	96.81
14	INFORMATION TECHNOLOGY	III	52	52	51	98.08
15	NUTRITION & DIETETICS	III	34	34	33	97.06
16	COGNITIVE SYSTEMS	III	35	35	30	85.71

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY - 18

END SEMESTER EXAMINATION – NOVEMBER 2023

RESULT ANALYSIS BEFORE REVALUATION

III UG

S.NO.	DEPARTMENT	SEM	NUMBER REGISTERED	NUMBER APPEARED	NUMBER OF PASS	PASS PERCENTAGE
1	TAMIL	V	15	15	14	93.33
2	ENGLISH	V	36	36	36	100
3	BSW	V	09	09	07	77.78
4	BBA	V	44	44	44	100
5	B.COM	V	246	246	234	95.12
6	B.COM (CA)	V	63	63	63	100
7	MATHEMATICS	V	52	52	51	98.08
8	PHYSICS	V	19	19	18	94.74
9	CHEMISTRY	V	20	20	18	90
10	MICROBIOLOGY	V	48	48	48	100
11	BIOTECHNOLOGY	V	34	34	34	100
12	COMPUTER SCIENCE	V	75	75	73	97.33
13	COMPUTER APPLICATIONS	V	56	56	56	100
14	INFORMATION TECHNOLOGY	V	22	22	22	100
15	NUTRITION & DIETETICS	V	28	28	27	96.42
16	COGNITIVE SYSTEMS	V	35	35	35	100

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY -18

END SEMESTER EXAMINATION RESULTS – NOVEMBER 2023

RESULT ANALYSIS BEFORE REVALUATION

I PG

S.NO.	DEPARTMENT	SEM	NUMBER REGISTERED	NUMBER APPEARED	NUMBER OF PASS	PASS PERCENTAGE
1	TAMIL	I	15	14	13	92.86
2	ENGLISH	I	23	23	22	95.65
3	MSW	I	14	14	14	100
4	COMMERCE	I	34	34	33	97.06
5	MATHEMATICS	I	23	23	22	95.65
6	PHYSICS	I	20	19	18	94.74
7	CHEMISTRY	I	23	23	17	73.91
8	MICROBIOLOGY	I	28	28	27	96.43
9	COMPUTER SCIENCE	I	25	25	25	100
10	FSM & D	I	26	26	26	100

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY -18

END SEMESTER EXAMINATION RESULTS – NOVEMBER 2023

RESULT ANALYSIS BEFORE REVALUATION

II PG

S.NO.	DEPARTMENT	SEM	NUMBER REGISTERED	NUMBER APPEARED	NUMBER OF PASS	PASS PERCENTAGE
1	TAMIL	III	8	8	8	100
2	ENGLISH	III	28	28	25	89.29
3	MSW	III	17	17	16	94.12
4	COMMERCE	III	34	34	33	97.06
5	MATHEMATICS	III	36	36	35	97.22
6	PHYSICS	III	19	19	17	89.47
7	CHEMISTRY	III	26	26	22	84.62
8	MICROBIOLOGY	III	17	17	17	100
9	COMPUTER SCIENCE	III	29	29	28	96.55
10	FSM & D	III	26	26	26	100