CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (III CYCLE) WITH "A" GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc Computer Science

Syllabus

2019-2022

B.Sc. Computer Science

PROGRAMME OUTCOMES

- To provide a solid foundation in the discipline of Computer Science and enable students to formulate computational solutions to real life problems
- To identify, analyze, design an optimized solution using appropriate algorithms of varying complexity using cutting edge technologies
- To develop skills in software and hardware so as to enable the students to establish a productive career in industry, research and academia
- To equip the students to meet the industrial needs by utilizing tools and technologies with the skills to communicate effectively among peers

Cauvery College for Women(Autonomous), Trichy-18
PG & Research Department of Computer Science
B.Sc Computer Science
(For the Candidates admitted from the Academic year 2019-2020 onwards)

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	இக்கால இலக்கியம்	19ULT1	6	3	3	25	75	100
			Story,Novel,Hindi Literature-I & Grammar-I	19ULH1						
			Communication in French-I	19ULF1						
			History of Popular Tales Literature and Sanskrit Story	19ULS1						
	II	English Language Course-I(ELC)	Functional Grammar for Effective Communication-I	19UE1	6	3	3	25	75	100
	III	Core Course – I(CC)	Programming in C	19UCS1CC1	6	6	3	25	75	100
		Core Practical - I (CP)	Programming in C Lab	19UCS1CC1P	3	3	3	40	60	100
		First Allied I	Essential Mathematics	19UCS1AC1	4	4	3	25	75	100
		First Allied II	Numerical Analysis and Statistics	19UCS1AC2	3	-	-	-	-	-
	IV	Value Education	Value Education	19UGVE	2	2	3	25	75	100
		TOTAL			**30**	**21**				**600**
II	I	Language Course-II(LC) Tamil/Other Languages	இடைக்கால இலக்கியமும் புதினமும்	19ULT2	6	3	3	25	75	100
			Prose,Drama,Hindi Literature-2 & Grammar-II	19ULH2						
			Communication in French-II	19ULF2						
			Poetry Textual Grammar and Alakara	19ULS2						
	II	English Language Course-II(ELC)	Functional Grammar for Effective Communication-II	19UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Java Programming	19UCS2CC2	6	6	3	25	75	100
		Core Practical - II (CP)	Java Programming Lab	19UCS2CC2P	3	3	3	40	60	100
		First Allied II	Numerical Analysis and Statistics	19UCS1AC2	3	3	3	25	75	100
		First Allied III	Operations Research	19UCS2AC3	4	2	3	25	75	100
	IV	Environmental Studies	Environmental Studies	19UGES	2	2	3	25	75	100
		TOTAL			**30**	**22**				**700**

III	I	Language Course-III (LC)-Tamil*/Other Languages**#	காப்பியமும் நாடகமும்	19ULT3	6	3	3	25	75	100
			Medieval,Modern Poetry & History of Hindi Literature-3	19ULH3						
			Communication in French-III	19ULF3						
			Prose,Textual Grammar and Vakyarachana	19ULS3						
	II	English Language Course-III(ELC)	Reading and Writing for Effective Communication-I	19UE3	6	3	3	25	75	100
	III	Core Course– III(CC)	Database Management Systems	19UCS3CC3	6	6	3	25	75	100
		Core Practical - III(CP)	SQL & PL/SQL Lab	19UCS3CC3P	3	3	3	40	60	100
		Second Allied I	Digital Computer Fundamentals	19UCS3AC4	4	3	3	25	75	100
		Second Allied II	Digital & Microprocessor Lab	19UCS3AC1P	3	-	-	-	-	-
	IV	Non Major Elective I	Office Automation Lab	19UCS3NME1P	2	2	3	40	60	100
			Basic Tamil	19ULC3BT1				25	75	
			Special Tamil	19ULC3ST1						
	V	Extra Credit Course	SWAYAM ONLINE COURSE	To be Fixed Later	As per UGC Recommendation					
		TOTAL			**30**	**20**				**600**
IV	I	Language Course - IV (LC) - Tamil */Other Language**#	பண்டைய இலக்கியம்	19ULT4	6	3	3	25	75	100
			Letter writing, General Essays, Technical Terms, Proverbs, Idioms &Phrases, Hindi Literature-4	19ULH4						
			Communication in French-IV	19ULF4						
			Drama,History of Drama Literature	19ULS4						
	II	English Language Course - IV(ELC)	Reading and Writing for Effective Communication-II	19UE4	6	3	3	25	75	100
	III	Core Course – IV(CC)	Data Structures & Algorithms	19UCS4CC4	5	5	3	25	75	100
		Core Practical - IV (CP)	Data Structures Lab using C	19UCS4CC4P	3	3	3	40	60	100
		Second Allied II	Digital & Microprocessor Lab	19UCS3AC1P	3	3	3	40	60	100
		Second Allied III	Microprocessor & Microcontrollers	19UCS4AC5	3	3	3	25	75	100
	IV	Non Major Elective II	Multimedia Lab	19UCS4NME2P	2	2	3	40	60	100
			Basic Tamil	19ULC4BT2				25	75	
			Special Tamil	19ULC4ST2						
		Skill Based Elective – I	PC Packages & Multimedia Lab	19UCS4SBE1AP						

			Computer Hardware and Trouble Shooting Lab	19UCS4SBE1BP	2	2	3	40	60	100
	V	Extra Credit Course	SWAYAM ONLINE COURSE	To be Fixed Later	As per UGC Recommendation					
			TOTAL		**30**	**24**				**800**
V	III	Core Course – V(CC)	Python Programming	19UCS5CC5	5	5	3	25	75	100
		Core Practical – V(CP)	Python Programming Lab	19UCS5CC5P	3	3	3	40	60	100
		Core Course - VI(CC)	Computer Graphics	19UCS5CC6	5	4	3	25	75	100
		Core Course – VII(CC)	Computer Networks	19UCS5CC7	6	5	3	25	75	100
		Major Based Elective – I	Computer Architecture	19UCS5MBE1A	5	4	3	25	75	100
			Software Engineering	19UCS5MBE1B						
			Cyber Security	19UCS5MBE1C						
	IV	Skill Based Elective – II	Mobile Application Development Lab	19UCS5SBE2AP	2	2	3	40	60	100
			Computer Networks Lab Using JAVA	19UCS5SBE2BP						
		Skill Based Elective – III	Software Testing Tool – Selenium	19UCS5SBE3AP	2	2	3	40	60	100
			Computer Graphics Lab Using C	19UCS5SBE3BP						
		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 Recommendation					
			TOTAL		**30**	**27**				**800**
VI	III	Core Course – VIII(CC)	Operating Systems	19UCS6CC8	6	5	3	25	75	100
		Core Course – IX(CC)	Web Technology	19UCS6CC9	6	5	3	25	75	100
		Major Based Elective – II	Cloud Computing	19UCS6MBE2A	6	5	3	25	75	100
			Fundamentals of Big data & IoT	19UCS6MBE2B						
			Artificial Intelligence	19UCS6MBE2C						
		Major Based Elective – III	Operating Systems Lab	19UCS6MBE3AP	5	5	3	40	60	100
			R Programming Lab	19UCS6MBE3BP						
			Web Technology Lab	19UCS6MBE3CP						
		Project	Project Work	19UCS6PW	6	4	3	-	100	100
	V	Gender Studies	Gender Studies	19UGGS	1	1	3	25	75	100
		Extension activity		19UGEA	0	1	0	-	-	-
			TOTAL		**30**	**26**				**600**
					180	**140**				**4100**

Note:
Part – I - Language – Tamil/Hindi/French/Sanskrit
Part –II - English
List of Allied Courses
Allied Course I - Mathematics
Allied Course II – Physics
Total No. of :
Core Papers - 9
Core Practicals - 5
Project - 1
Allied Paper - 5
Allied Practical - 1
Part I Language - 4
Part II English - 4
Non-Major Elective - 2
Skill Based Elective - 3
Extra Credit Course - 3
Major Based Elective - 3
Value Education -1
Environmental Studies - 1
Professional Skills - 1
Gender Studies - 1
Extension Activities - 1 (Credit only) *

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)

Semester I	Internal Marks: 25			External Marks:75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS1CC1	**PROGRAMMING IN C**	**CORE**	**90**	**6**	**-**	**6**

Objective

- To articulate the learning of C Language for beginners with all major features of C
- This subject will also create foundation to learn another complex programming languages like C++,Java etc.,

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Acquire programming logic, use of program instructions, syntax, program structure.	K1
CO2	Understand the concept of arrays and functions.	K2
CO3	Classify the structure, union, pointers and files in the program.	K3
CO4	Solve various problems using C features.	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	M	S	M
CO3	S	M	S	M
CO4	S	M	S	S

S–Strong; M–Medium; L -Low

Syllabus

UNIT I **(20 HOURS)**

Overview of C – Introduction - character set - C tokens - keyword & identifiers – constants – variables - data types – declarations of variables – arithmetic, relational, logical, assignment, conditional, bit wise, special, increment and decrement operators - arithmetic expressions - evaluation of expression - operator precedence & associativity - mathematical functions - reading & writing a character - formatted input and output.

UNIT II (**15 HOURS)**

Decision Statements: If, if-else, switch, break, continue-the?:operator-the GOTO statement.–Loop Control Statements: introduction–for, nested for loops–while, do-while statements – Arrays: one-dimensional - two dimensional – multidimensional arrays.

UNIT III **(20 HOURS)**

Character string handling - declaring and initialising string variables - reading strings from terminal - writing strings to screen - string handling functions - User-defined functions: need for user defined functions – types of functions - calling a function category of functions -no arguments and no return values - arguments but no return values - arguments with return values– recursion-functions with arrays-the scope and lifetime of variables in functions.

UNIT IV **(20 HOURS)**

Structure definition: structure initialization - comparison of structure variables - arrays of structures - arrays within structures - structures within structures – unions. Pointers: understanding pointers - accessing the address of a variable - declaring and initializing pointers - accessing a variable through its pointers - pointer expressions - pointers and arrays - pointers and character strings - pointers and functions - pointers and structures.

UNIT V **(15 HOURS)**

File management in C: defining and opening file - closing file - I/O operations on files- error handling during I/O operations - random access to files – command line arguments.

Text Book

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAROF PUBLICATION
1.	E.Balagurusamy	Programming In ANSI C	Tata Mc Graw Hill, 7th Edition	2017

Reference Books

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1.	Byron Gottfried	Programming with C	Tata Mc Graw Hill, 3rd Edition	2013
2.	D.Ravichandran	Programming in C	NewAge International(P)Ltd., 1st Edition	2006

Web References

1. http://www.tutorialspoint.com/cprogramming/index.htm
2. http://www.cprogramming.com/tutorial/c-tutorial.html
3. http://www.w3schools.in/c
4. http://fresh2refresh.com/c-tutorial-for-beginners

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

1. Ms.S.Saranya
2. Ms.N.Agalya

Semester I	Internal Marks: 40			External Marks:60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS1CC1P	**PROGRAMMING IN C LAB**	**CORE**	**45**	**-**	**3**	**3**

Objective

- To provide the hands on experience on C Programming and improve the practical skill set
- The learner will be able to develop the logic for the given problem, recognize and understand the syntax and construction of C code
- To know the steps involved in compiling, linking and debugging C code, feel more confident about writing the C functions, write some complex programs

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the basic terminologies of C programming by using different data types, decision structures, loops and functions.	K1
CO2	Understand the dynamic memory allocation by the use of pointers and files.	K2
CO3	Demonstrate practical experience in developing solutions using C	K3
CO4	Apply, compile and debug programs in C language	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	M
CO2	S	S	S	M
CO3	S	S	S	S
CO4	S	S	S	S

S–Strong; M–Medium; L -Low

Syllabus

1. Programs using various Datatypes
2. Programs using Different Operators
3. Decision Making Statements
4. Looping Statements
5. Programs using user defined functions and recursive functions
6. Programs using one dimensional and two dimensional arrays
7. String Manipulation using string functions
8. Programs using pointers
9. Programs using structures and unions
10. Creatingand Manipulating file

WebReferences

1. http://www.tutorialspoint.com/cprogramming/index.htm
2. http://www.cprogramming.com/tutorial/c-tutorial.html
3. http://www.w3schools.in/c
4. http://fresh2refresh.com/c-tutorial-for-beginners

Pedagogy

Power point Presentations, E-Content

Course Designers

1. Ms.S.Saranya
2. Ms.N.Agalya

Semester I	Internal Marks: 25			External Marks:75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS1AC1	**ESSENTIAL MATHEMATICS**	**ALLIED**	**60**	**4**	**-**	**4**

Objective

- To equip the students with mathematical methods formatted for their major concepts and train them in basic Differentiations and Integrations

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	State the basic concepts of graph theory	K1
CO2	Explain the concepts of Matrices and its types	K2
CO3	Compute characteristic equation of a matrix and its inverse by Cayley Hamilton theorem	K3
CO4	Apply Differentiation to find the solutions of Ordinary and Partial Differentiation	K3
CO5	Classify the various types of integrals	K3
CO6	Solve different types of ordinary differential equation	K3
CO7	Classify the characteristics of graph theory	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	M
CO2	S	S	M	M
CO3	S	S	S	S
CO4	M	M	M	M
CO5	S	S	M	M
CO6	S	M	M	M
CO7	S	S	S	S

S–Strong; M–Medium; L -Low

Syllabus

UNIT I **(12 HOURS)**

Matrices

Singular matrices – Inverse of a non-singular matrix using adjoint method - Rank of a Matrix–Consistency-Characteristicequation,Eigenvalues,Eigenvectors–CayleyHamilton's Theorem (proof not needed) –Simple applications only

UNIT II **(12 HOURS)**

Differentiation

Maxima & Minima – Concavity, Convexity – Points of inflexion - Partial differentiation – Euler's Theorem - Total differential coefficients (proof not needed) –Simple problems only.

UNIT III **(12 HOURS)**

Integration

Evaluation of integrals of types

(1). $\int \frac{px+q}{ax^2+bx+c}dx$ (2). $\int \frac{px+q}{\sqrt{ax^2+bx+c}}dx$ (3). $\int \frac{dx}{a+b\sin x}$ (4). $\int \frac{dx}{\cos x}\ a+b$

Evaluation using Integration by parts – Properties of definite integrals.

UNIT IV **(12 HOURS)**

Differential Equations

Variables Separables–Linear equations–Second order of types$(aD^2+bD+c)y=F(x)$ where a,b,c are constants and F(x) is one of the following types (i)e^{kx} (ii)sin(kx) and cos (kx) (iii) x^n , n being an integer (iv) e^{kx} f(x)

UNIT V **(12 HOURS)**

Graph Theory

Basic concepts- Finite and infinite graphs-Incidence and degree ideas on vertices – Isomorphism, Sub graphs, Walks – Paths and Circuits – Euler graphs.

Text Books

S.No	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	T.K. Manichavasagam Pillai and others	Algebra, Volume II	S.Viswanathan Pvt Limited	1985
2	S. Narayanan, T.K. Manichavasagam Pillai	Calculus, Volume I.	S. Viswanathan Pvt Limited	2003
3	S. Narayanan, T.K. Manichavasagam Pillai	Calculus, Volume II.	S. Viswanathan Pvt Limited	2003
4	S. Narayanan, T.K. Manichavasagam Pillai	Calculus, VolumeIII.	S. Viswanathan Pvt Limited	2003
5	Narsingh Deo	Graph Theory	Hall of india Pvt Ltd	1997

UNIT	CHAPTER	TEXT BOOK	SECTION
I	2	1	1- 8, 10-16
II	5,8	2	1.1 - 1.5, 2 1.1 -1.6
III	1	3	7.1 – 7.3, 8(Case II),9,11,12
IV	1,2	4	2.1 , 2.4 1 - 4
V	1,2	5	1.1 –1.5 2.1 –2.6

Reference Books

S.No	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	A.Singaravelu	Allied Mathematics	A.R.Publications	2003
2	P.R.Vittal	Allied Mathematics	Margham Publications, Chennai	2014
3	S.Arumugam and S.Ramachandran	Invitation to Graph Theory	SciTech Publications(India)Pvt Ltd.,Chennai	2006

Pedagogy

Assignment, Seminar, Lecture, Quiz, Group discussion, Brain storming, e- content.

Course Designers

1. Dr.V.Geetha
2. Dr.S.Sasikala

Semester I & II	Internal Marks: 25			External Marks:75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS1AC2	**NUMERICAL ANALYSIS AND STATISTICS**	**ALLIED**	**90**	**3**	**-**	**3**

Objective

- To train the students in numerical and statistical problems
- To practice the students for solving statistical problems
- Motivating the students to analysis the real life problems

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Apply numerical methods to solve Algebraic, Transcendental equations and Interpolation	K3
CO2	Solve numerical integration and system of linear equation by appropriate methods.	K3
CO3	Compute the numerical solution of ordinary differential equation by various method	K3
CO4	Explain the concept of measures of central tendency and dispersion.	K2
CO5	Explain correlation and regression and solve the numerical problems.	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	M	M
CO3	S	S	M	M
CO4	S	S	M	M
CO5	S	S	S	S

S – Strong; M – Medium; L - Low

SYLLABUS

UNIT I **(15 HOURS)**

Solution of Algebraic & Transcendental Equations

Introduction- The Bisection Method - The Iteration method - The Method of False Position - Newton Raphson Method (Problems Only)

Interpolation

Finite differences –Forward Differences - Backward Differences - Central Differences – Newton's formulae for interpolation - Lagrange's interpolation formula.

UNIT II **(15 HOURS)**

Numerical Differentiation and Integration

Numerical Integration-Trapezoidal Rule-Simpson's $\frac{1}{3}$rule-Simpson's $\frac{3}{8}$rule (proof not needed)

Matrices and Linear System of Equations

Solutions to Linear Systems – Direct Method - Gauss Elimination - Gauss Jordon method - Solutions to Linear Systems -Iterative methods (Problems Only)

UNIT III **(15 HOURS)**

Numerical solution of Ordinary Differential Equations

Introduction - Solution by Taylor Series - Picard's Method of Successive Approximations - Euler's Method - Modified Euler's Method - Runge - Kutta Method- Predictor - Corrector Method -Adams – Moulton Method - Milne's Method.

UNIT IV **(15 HOURS)**

Measures of Central Tendency

Arithmetic Mean - Median - Mode - Geometric Mean – Harmonic Mean.

Measures of Dispersion

Range- Quartile Deviation - Mean Deviation - Standard Deviation (Problems Only)

UNIT V **(15 HOURS)**

Correlation

Introduction - Meaning of Correlation – Scatter Diagram – Karl Pearson's Coefficient of Correlation – Rank Correlation

Linear Regression

Introduction – Linear Regression –Regression Coefficients – Properties of Regression Coefficients – Angle Between Two lines of Regression – Standard Error of Estimate or Regression Variance _ Correction Coefficient Between Observed and Estimate Value (Problems Only)

Text Books:

S.No	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	S.S.Sastry	Introductory methods of Numerical Analysis,Third Edition	PrenticeHall ofIndia Private Limited	1998
2	Gupta.S.C& Kapoor, V.K	Fundamentals of Mathematical Statistics	Sultan Chand & sons, New Delhi	2010

UNIT	CHAPTER	TEXT BOOK	SECTION
I	2 3	1	2.1 – 2.5(Omit 2.3.1) 3.3 (Omit 3.3.4), 3.6, 3.9.1
II	5 6		5.4.1 – 5.4.3 6.3.2 & 6.4
III	7		7.1 – 7.6 (Omit 7.4.1)
IV	2	2	2.5 – 2.9, 2.13
V	10 11		10.1 – 10.4, 10.7 11.1 & 11.2

Reference Books:

S.No	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	M.K. Jain, S.R.K. Iyengar and R.K. Jain	Numerical Methods for Scientific and Engineering Computations	New Age International PrivateLimited	2003
2	RSN Pillai and Bagavathi	Statistics Theory and practice	S. Chand &Company Ltd, New Delhi	2014

Pedagogy

Assignment, Seminar, Lecture, Quiz, Group discussion, Brain storming, e-content.

Course Designers

1. Dr.V.Geetha

2.Dr.S.Sasikala

Semester II	Internal Marks: 25			External Marks:75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS2CC2	**JAVA PROGRAMMING**	**CORE**	**90**	**6**	**-**	**6**

Objective

- To inculcate knowledge in Java programming concepts
- To provide knowledge in Package and Applet concepts
- To enrich the knowledge in Multithread and Graphics concept

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the necessary attributes and methods of an object, hierarchical classification of classes	**K1**
CO2	Execute inheritance codes ,packages & collection interfaces	**K2**
CO3	Develop desktop application using multi-threading, IO concepts, GUI to solve real-time problems and design distributed applications	**K3**
CO4	Classify the multitasking application using exception handling concepts	**K3**
CO5	Apply GUI concepts	**K3**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	S	S
CO2	S	S	S	S
CO3	S	S	S	S
CO4	S	S	S	S
CO5	S	M	S	S

S–Strong; M–Medium; L -Low

Syllabus

Unit I **(18HOURS)**

Java Evolution: Java Features – How Java differs from C and C++ – Java and Internet – Java and World Wide Web – Web Browsers – Hardware and Software Requirements – Java Environment. Overview of Java Language: Simple Java Program – Java Program Structure – Java Tokens – Java Statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments. Constants – Variables – Data types – Declaration of Variables – GivingValuestovariables–Scopeof Variables–SymbolicConstants–TypeCasting-Operators and Expressions- Decision Making and Branching

Unit II **(18HOURS)**

Class, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing class members – Constructors – Methods Overloading–Static Members–Nesting of Methods–Inheritance–Overriding Methods–Final Variables and Methods – Final Classes – Finalizer Methods – Abstract Methods and Classes – Visibility Control. Arrays, Strings and Vectors: One – dimensional Arrays – creating an Array – Two dimensional Arrays – Strings – Vectors – Wrapper Classes– Enumerated Types. Interfaces: Multiple Inheritance-Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

Unit III **(18HOURS)**

Packages: Java API Packages – Using system Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import. Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods–ThreadExceptions–Thread Priority–Synchronization– ImplementingtheRunnable Interface.

Unit IV **(18HOURS)**

Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Using Exceptions for debugging. Applet Programming: How Applets differ from Applications – Preparing to write Applets – Building Applet Code – Applet Life Cycle – Creating an executable Applet – Designing a WebPage – Applet Tag – Adding Applet to HTML file – Running the Applet.

Unit V **(18HOURS)**

Graphics Programming: The Graphics Class – Lines and Rectangles – Circles and Ellipses, Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – DrawingBarCharts.ManagingInput/OutputFilesinJava:ConceptofStreams–StreamClasses – Byte Stream Classes– Character Stream Classes – Using Streams – Other Useful I/O Classes – Using the file Class – I/O Exceptions – Creation of Files – Reading / Writing Characters – Reading / Writing Bytes – Handling Primitive Data Types – Concatenating and Buffering Files– Random Access Files – Interactive Input and Output.

Text Book

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAROF PUBLICATION
1.	E.Balagurusamy	Programmingwith Java	A primer, Tata McGraw Hill, Fourth Edition	2008

Chapters

UnitI : 1, 2, 3, 4, 5,6.
UnitII : 8, 9,10.
UnitIII : 11,12.
UnitIV : 13,14
UnitV : 15,16

Reference Books

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1.	Debasish Jana	Java and Object-Oriented Programming Paradigm	Prentice Hall of India Private Limited, New Delhi	2008
2.	Herbert Schildt	The Complete Reference Java2	Tata Mc Graw Hill, FifthEdition	2002

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. https://docs.oracle.com/javase/tutorial/collections/intro/
5. http://way2java.com/java-versions-2/jdk-1-8-features/

Pedagogy

Assignment, Seminar, Lecture, Quiz, Group Discussion, PowerPoint presentations, Brainstorming, e-content.

Course Designer

Ms. M. Gowri Sudha

Semester II	Internal Marks: 40			External Marks:60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS2CC2P	**JAVA PROGRAMMING LAB**	**CORE**	**45**	**-**	**3**	**3**

Objective

- To demonstrate the programming concepts of Java
- Apply the object oriented concepts to create stand-alone applications
- DesignanddevelopGUIapplicationsusingAbstractWindowToolkit(AWT)andEvent Handling

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recall the fundamentals of Java programming concepts	**K1**
CO2	Execute inheritance codes ,packages & collection interfaces	**K2**
CO3	Predict the exception occurrence on the code and handle it efficiently	**K3**
CO4	Build the user interface of the application and handle the events by using AWT components	**K3**

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	S	S
CO2	S	S	S	S
CO3	S	S	S	S
CO4	S	S	S	S

S–Strong; M–Medium; L – Low

Syllabus

1. Class and Objects
2. Program using Control Statements
3. Program using different Inheritance
4. Interfaces
5. Packages
6. Program to implement Exception Handling
7. Illustrate Thread Priority
8. Program using Mouse Events
9. Program to implement font class method
10. Illustrate Multithreading Application

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. https://docs.oracle.com/javase/tutorial/collections/intro/
5. http://way2java.com/java-versions-2/jdk-1-8-features/

Pedagogy

Power point Presentation, e-content.

Course Designer Ms. M. Gowri Sudha

Semester II	Internal Marks: 25			External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDITS
19UCS2AC3	OPERATIONS RESEARCH	ALLIED	60	4	-	2

Objective

- To inculcate the basic concepts of Operations Research
- To practice the students for solving Operation Research Problems
- Motivating the students to compare the real life problem with operations research

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Explain the applications of Operations research.	K2
CO2	Illustrate the formulations of Linear Programming Problem and Solve them by graphical method	K3
CO3	Classify the different types of Simplex methods	K3
CO4	Describe the concepts of Transportation Problem and Assignment Problem and compute the solution by various methods	K3
CO5	Determine the solution of Sequencing Problem	K4
CO6	Compute PERT and CPM in Network Analysis	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	M	M
CO2	S	S	S	S
CO3	M	S	M	M
CO4	S	S	S	S
CO5	S	S	S	S
CO6	S	S	S	S

S – Strong; M – Medium; L - Low

SYLLABUS

UNIT I **(10 HOURS)**

Operations Research

Introduction-Origin and Development of O.R.- Nature and Features of O.R.- Scientific Method in O.R.- Modelling in Operations Research - Advantage and Limitation of Models- General Solution Methods for O.R. Models- Methodology of Operations Research- Operations Research and Decision Making- Application of Operations Research**.**

Linear Programming Problem- Mathematical Formulation Introduction-Linear programming Problem- Mathematical Formulation of the problem -Illustrations on Mathematical Formulation of LPPs.(simple problems only)

Linear programming problem-graphical Solution and Extension

Introduction- Graphical Solution Method-Some Exceptional Cases-General Linear Programming Problem- Canonical and Standard Forms of LPP.

UNIT II **(15 HOURS)**

Linear Programming Problem-Simplex Method

Introduction-Fundamental Properties of Solutions- The computational Procedure- The Simplex Algorithm- Use of Artificial Variables-Two-Phase method-Big M method.(simple problems only).

UNIT III **(15 HOURS)**

Transportation problem

Introduction-LP Formulation of the Transportation Problem- Existence of Solution in T.P-The Transportation Table-Loops in Transportation Table-Solution of a Transportation Problem-Finding an Initial Basic Feasible Solution-Test for Optimality-Economic interpretation of u_i s and v_j s- Degeneracy in Transportation Problem-Transportation Algorithm (MODI method),(simple problems only).

Assignment Problem

Introduction-Mathematical Formulation of the Problem- Solution Methods of Assignment Problem-Special Cases in Assignment Problems- The Travelling Salesman problem.(simple problems only).

UNIT IV **(10 HOURS)**

Sequencing problem

Introduction-Problem of Sequencing-Basic Terms Used in Sequencing- Processing n Jobs through Two Machines- Processing n Jobs through K Machines-Processing 2 Jobs through K Machines.(problems only).

UNIT V **(10 HOURS)**

Network Scheduling by PERT/CPM

Introduction- Network: Basic Components- Logical Sequencing- Rules of Network Construction-Concurrent Activities-Critical Path Analysis -Probability Considerations in PERT-Distinction between PERT and CPM.

Text Book:

S.No	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	KantiswarupP.K.Gupta & Man Mohan	Operations Research	Sultan Chand and Sons Publishers, New Delhi, fourteen edition	2008

UNIT	CHAPTER	SECTION
I	1 2 3	1.1 - 1.10 2.1 – 2.4 3.1 – 3.5
II	4	4.1 – 4.4
III	10	10.1 -10.3,10.5,10.6 10.8-10.13 11.1 – 11.4,11.7
IV	12	12.1 – 12.6
V	25	25.1 – 25.8

Reference Books:

S.No	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	Prem Kumar Gupta and D.S. Hira,	An Operations Research	S. Chand and Co., Ltd. NewDelhi	2004
2	Hamdy A. Taha	Operations Research: An Introduction	Phi Learning, New Delhi	2007

Pedagogy

Assignment, Seminar, Lecture, Quiz, Group discussion, Power point presentations, Brain storming, e- content.

Course Designers

1. Dr.V.Geetha
2. Dr.S.Sasikala

Semester III	Internal Marks: 25			External Marks:75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS3CC3	**DATABASE MANAGEMENT SYSTEMS**	**CORE**	**90**	**6**	**-**	**6**

Objective

- To study the basic concepts of database systems, relational database and queries,object modeling and database design
- To understand the strategies for storing objects, transaction management, and security
- To inculcate knowledge on DBMS concepts

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Design ER model to represent simple database application scenario	K2
CO2	Apply normalization to improve the database design	K3
CO3	Explain the transaction processing and concurrency control	K2
CO4	Apply SQL commands to manipulate data	K3
CO5	Solve a data intensive application using PL/SQL	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	M	S	M
CO3	S	M	S	M
CO4	S	M	S	S
CO5	S	M	S	M

S–Strong; M – Medium; L -Low

Syllabus

UNIT I **(20 HOURS)**

Introduction to DBMS: Characteristics of Data in Database – Database Management system – Types of Database management system – Introduction to RDBMS : Introduction – RDBMS Terminology– The Relational Data structure – Relational Data Integrity – Relational Data Manipulation – Codd's Rules – Database Architecture and Data Modeling: Introduction – Conceptual, physical and logical database models – Database Design – Design Constraints – Functional Dependencies.

UNIT II **(20 HOURS)**

Entity – Relationship Modeling: Introduction – E – R model – Components of an E – R model – Entities – Attributes – E – R Diagram conventions – Relationships – ER modeling symbols – Data Normalization: Introduction – Keys – Relationships – First NF – Second NF – Third NF – Boyce Codd's NF – Fourth NF – Fifth NF – Domain Key NF – Demoralization.

UNIT III **(20 HOURS)**

Transaction management and concurrency control: Introduction – Transactions – Transaction properties – Database Structure – Transaction states – Concurrency control – Serializability – Recoverability – Concurrency Control Schemes – Transaction Management in SQL – Transactions and Recovery – User defined Transactions – The COMMIT command – The ROLLBACK command – The SAVEPOINT command – Data Integrity – Introduction – Types of Integrity Constraints – Restrictions on Integrity Constraints.

UNIT IV **(15 HOURS)**

Introduction to SQL: Introduction – Characteristics of SQL – Advantages of SQL – SQL data types and Literals – Types of SQL Commands – SQL operators – Tables, Views and Indexes: Tables – Views – Indexes – Queries and Sub queries: Queries – Sub queries.

UNIT V **(15 HOURS)**

Aggregate Functions – Insert, Update and Delete Operations – Cursors – Joins and Unions – Introduction to PL/SQL.

NOSQL: features of NoSQL-Types of NoSQL Databases-Why NoSQL-Advantages of NoSQL- NoSQL in industry-SQL Versus NoSQL.

Text Books

S.No.	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1.	Alexis Leon & Mathews Leon	Database Management Systems	Vikas Publishing	2008
2.	Seema Acharya, Subhashini Chellappan	Bigdata and Analytics	Wiley India Pvt.Ltd	2015

Chapters:

Unit I : 5, 7, 8
Unit II : 9, 11
Unit III : 28, 29
Unit IV : 14, 15, 17
Unit V : 18, 19, 20, 21, Page No.933 to 948, 952 to 967
Unit V : 4, Page No.58 to 63 (in TextBook2)

Reference Books

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1.	Raghu Ramakrishnan& Johannes Gehrke	Database Management Systems	Tata McGraw Hill International Edition, Third Edition	2003
2.	Abraham Silberschatz, Henry F. Korth, S. Sudarshan	Database System Concepts	Tata McGraw HillInternational Edition	2006

Web References

1. https://www.tutorialspoint.com/
2. https://www.sausriengg.com/e-course-material
3. https://www.ntu.edu.sg/home/ehchua/programming/sql/

Pedagogy

Quiz, Assignment, Chalk & Talk, Power point Presentations

Course Designer

Ms. M. Gowri Sudha

Semester III	Internal Marks: 40			External Marks:60		
COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDITS
19UCS3CC3P	SQL & PL/SQL LAB	CORE	45	-	3	3

Objective

- To understand the concepts of basic query language
- Apply the fundamentals of DDL, DML, DCL and TCL
- Implement new developments and trends in developing a database

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the operators, basic commands, built-in functions in MySQL	K1
CO2	Compute Aggregate functions, join operations and string functions	K2
CO3	Implement RDBMS concept in developing simple applications using MySQL	K3
CO4	Apply the techniques of Exception Handling using PL/SQL.	K3
CO5	Solve the various types of online applications	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	M	S	M
CO3	S	M	S	M
CO4	S	M	S	S
CO5	S	M	S	M

S–Strong; M – Medium; L-Low

Syllabus

1. DDL & DML operations
2. Set operations
3. Aggregate functions
4. Join operations
5. Nested subqueries
6. Create a view and expand it
7. String operations
8. Create a database for a banking enterprise and generate suitable reports
9. Write a PL/SQL program to raise an user defined exception
10. Write a PL/SQL program to raise system defined exception
11. Write a PL/SQL program using function
12 . Write a PL/SQL program using procedure

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 Presentation, Demonstration

Course Designer Ms. M. Gowri Sudha

Semester: III	Internal Marks: 25		External Marks:75			
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS3AC4	**DIGITAL COMPUTER FUNDAMENTALS**	**ALLIED**	**60**	**4**	**-**	**3**

Objective

- To acquire the knowledge and understanding of various number systems &codes
- To enable the students to gain knowledge in memory storage
- To distinguish the combination logic circuits & sequential logic circuits

Course Outcomes

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

Co Number	CO statement	Knowledge level
CO1	Outline the knowledge of Numbers and Code system	K2
CO2	Extend the concept of Boolean Algebra and Logic Gates.	K2
CO3	Apply the Concepts of number conversion as Combinational Logic circuits and Sequential Logic Circuits:	K3
CO4	Utilize the Digital concepts as a memory storage	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	M
CO2	S	S	M	M	M
CO3	S	S	M	M	M
CO4	S	S	M	M	M

S–Strong; **M**–Medium; **L**–Low

Syllabus

UNIT I - Number Systems and Codes **(10 HOURS)**

Introduction to Number Systems and Conversion – Binary to Decimal Conversion – Decimal to Binary Conversion – Binary Addition and Subtraction – Binary Multiplication and Division– Representation of Negative Numbers - 1's complement and 2's complement - Complement arithmetic-BCD code, Digital Codes -Excess-3 code, Graycode, Binaryto Excess -3 code conversion and vice versa**.**

UNIT II - Boolean Algebra and Logic Gates **(15 HOURS)**

Boolean Algebra: Definitions –Rules and Laws of Boolean Algebra – Boolean Functions – Minterms and Maxterms – Simplification of Boolean expressions – Demerger's Theorems. Logic Gates: Basic Gates and – Applications of XOR Gate – The Exclusive NOR Gate – Positive and Negative Logic – Logic Characteristics– Universal Building Blocks (UBB) – NAND Gate as UBB
– NOR Gate as UBB. Karnaugh Map with 2, 3 and 4 variables- Don't Care Conditions – Overlapping Groups – Rolling the Map.

UNITIII - Combinational Logic Circuits **(10 HOURS)**

Design Procedure - Half and Full Adders – BCD Adder - Binary Subtractors – Half and Full Subtractors – Multiplexers (4:1 line) – 1 to 4 line Demultiplexers – Decoders: BCD to decimal -

BCD to Seven Segment - Encoders: 4:2 line, Octal to Binary .

UNIT IV - Sequential Logic Circuits **(10 HOURS)**

Flip Flops – RS Flip Flop – Clocked RS Flip Flop – D Flip Flop – JK Flip Flop – T Flip Flop – Triggering of Flip Flops – Master Slave Flip Flop – Counters – synchronous Counter – Asynchronous/Ripple Counter – Ring Counter – Programmable Arrays of Logic Cells – Shift Registers- SISO – SIPO – PIPO –PISO.

UNIT V - Memory and Storage **(15 HOURS)**

Classification of memories – ROM – ROM organization – PROM – EPROM – EEPROM –EAPROM, RAM – RAM organization – Write operation – Read operation – Memory cycle Static RAM Cell-Bipolar RAM cell – MOSFET RAM cell – Dynamic RAM cell –Programmable Logic Devices – Programmable Logic Array (PLA) – Programmable Array Logic (PAL) .

Text Books

S.No.	Authors	Title of the book	Publishers	Year of Publication	Edition
1	V.Vijayendran	Introduction to Integrated Electronics: Digital and Analog	Viswanathan S., Printers & Publishers Pvt Ltd	2009	Revised Edition

Reference Books

S.No.	Authors	Title of the book	Publishers	Year of Publication	Edition
1	A. Anand Kumar	Fundamentals of Digital Electronics	PHI Learning Pvt. Ltd.	2016	4th Edition
2	D.A.GodseA.P.Godse	Digital Electronics	Technical publications	2008	3rd Edition

Pedagogy

Lecture with Discussion, Power point presentation, Group discussion and Seminars.

Course designer

Ms.S.Priya

Semester III & IV	Internal Marks: 40		External Marks:60			
SUBJECT CODE	**SUBJECT TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS3AC1P	**DIGITAL & MICROPROCESSOR LAB**	**ALLIED-II**	**90**	**-**	**3**	**3**

Objective

- To enable the student to gain practical knowledge
- To acquire basic understanding of laboratory technique
- To understand the theory and develop practical application skills

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recall the principles of electronics.	K1
CO2	Interpret findings using the correct physical scientific framework.	K2
CO3	Develop skills in handling equipment.	K3
CO4	Design electronic circuits.	K3
CO5	Build hands on experience using various techniques.	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	S
CO2	M	S	S	M	M
CO3	S	M	S	M	M
CO4	S	S	M	S	M
CO5	S	M	M	S	S

S – Strong; **M** – Medium; **L -** Low

Syllabus

List of experiments

Section A: Digital Electronics

1. Verification of Logic gates.

2. Construction of Half and Full adder.
3. Construction of Half and Full subtractor.
4. K-Map.
5. NAND as UBB.
6. NOR as UBB.

Section B: 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. Find the sum of series.
6. 1's compliment and 2's compliment subtraction.

Text Books

S.No.	Authors	Title of the book	Publishers	Year of Publication	Edition
1.	V.Vijayendran	Introduction to Integrated Electronics: Digital and Analog	Viswanathan S., Printers & Publishers Pvt Ltd	2009	Revised Edition
2.	B.Ram	Fundamental of Microprocessor and microcontroller	Dhanpat Rai Publications(P) Ltd, New Delhi	2013	8th Edition

Pedagogy

Demonstration and practical sessions.

Course Designer:

Ms.N.Manopradha

Semester III	Internal Marks: 40			External Marks:60		
COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDITS
19UCS3NME1P	OFFICE AUTOMATION LAB	NME	30	-	2	2

Objective

- To have a hands on experience in Microsoft Office package
- To familiarize the students in preparation of documents and presentations with office automationtools
- To inculcate the knowledge of Macros

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Describe the concepts of Office Package.	K1
CO2	Recognize when to use each of the Office programs to create professional and academic documents.	K2
CO3	Use Office programs to create personal, academic and business documents following current professional and/or industry standards.	K3
CO4	Test the working knowledge of advanced concepts of Office Software.	K4
CO5	Assess oneselfto get employment with this practical hands on training.	K6

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	M	S	M
CO3	S	M	S	M
CO4	S	M	S	S
CO5	S	M	S	M

S–Strong; M – Medium; L -Low

Syllabus

1. Open a new office document and perform the following operations in it

i. Text Alignment

ii. Change line spacing to 1.5

iii. Place a box to the entire text

iv. Add the bullets and numbering

v. Change type of font types and sizes

vi. Insert the symbols

2. Prepare an advertisement to a company with the following specifications

i. Attractive Page Border.

ii. Design the name of company using WordArt.

iii. Use ClipArt .

3. Design a Visiting Card for a company with the following specifications

i. Size of the Visiting Card is 4" X 3".

ii. Name of the company with a WortArt.

4. Perform Table Creation, Formatting and Conversion.

5. Perform mail merge and letter preparation.

6.Working with Macros

7. Perform the formula editor.

8. Perform the insertion of objects, graphics and protecting the document.

9 .Draw a line, XY, bar and pie chart for a given user data.

10. Perform the sorting and import/export features.

11. Create a Presentation using wizard.

12. Create a presentation on Tourism of a place using different template, color schema and text Formats.

13. Create a presentation about your college and department using animations and sound effects. Add OLE object to your presentation.

Web References

1. https://www.tutorials.com/
2. https://www.computer-pdf.com/

Pedagogy

Power point Presentation, Demonstration

Course Designer

Ms.V.Kavitha

Semester IV	Internal Marks : 25			External Marks:75		
COURSE CODE	**COURSE TITILE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS4CC4	**DATA STRUCTURES & ALGORITHMS**	**CORE**	**75**	**5**	**-**	**5**

Objective

- Understanding basic concepts of various data structures and the different ways of organizing them
- To articulate the essential components and operations of the data structures
- To familiarize knowledge in designing algorithms using the data structures

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand storage organization & operations of data structure	K1
CO2	Demonstrate problems to represent the linear and nonlinear structures	K3
CO3	Analyse the various types of data structure	K4
CO4	Discuss various sorting and searching techniques	K2

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	M	M	M
CO3	S	S	S	S
CO4	S	S	M	S

S-Strong, M-Medium, L- Low

Syllabus

UNIT I : BASIC TERMINOLOGY (12 HOURS)

Overview of Data Structures- Abstract Data Types - Definition and an example – Arrays - Axiomatization – Ordered Lists - Sparse Matrices-Representation of arrays.

UNIT II: STACK & QUEUE (15 HOURS)

Overview of Stacks and Queues-Operations on Stack-PUSH and POP-Operation on Queue-INSERT and DELETE- application of stack – Evaluation of Expressions-Recursion- Circular Queue, Deque, Priority Queue an overview.

UNIT III: LINKED LISTS (16 HOURS)

Overview of Linked list – Representation of Linked List in Memory –Operations: Traversing a Linked list ,Searching a Linked List-Insertion into a Linked List – Deletion from a Linked List-

application of linked list-Polynomial addition – Linked Stacks and Queues – Dynamic storage Management -Memory allocation- Garbage collection.

UNIT IV : TREES & GRAPHS (16 HOURS)

Trees Terminology – Binary tree representations – Tree Traversal – Threaded Binary Trees – Graphs Terminology – Memory Representations of Graphs – Traversals, Connected Components and Spanning Trees

UNIT V: ALGORITHM: SORTING & SEARCHING (16 HOURS)

Algorithm-Overview-Pseudocode-complexity of algorithm-Bubble Sort-Insertion Sort- Heap Sort-Quick Sort. Searching- Linear Search – Binary Search- Finding maximum and minimum.

Text Books

S.No	AUTHOR	TITLE	PUBLICATION /EDITION	YEAR OF PUBLICATION
1	Ellis Horowiz, Sartaj Sahni	Fundamentals of Data Structure	Galgotia Publications	2010
2	Ellis Horowiz, Sartaj Sahni and Sanguthevar	Fundamentals of Computer Algorithms	Galgotia Publications	2009

Reference Books

S.No	AUTHOR	TITLE	PUBLICATION /EDITION	YEAR OF PUBLICATION
1	Jean-Paul Tremblay and Paul G. Sorenson	An Introduction to Data Structures with Applications	Tata McGraw-Hill, Second Edition	2001
2	Alfred V. Aho, John E. Hopcroft and Jeffry D. Ullman	Data Structures and Algorithms	Pearson Education	2006
3	Seymour Lipshutz	Data Structures with C	Tata McGraw Hill Education Pvt Ltd 3 rd Edition	2011

Web References

1. www.studytonight.com/data-structures
2. https://lpuguidecom.files.wordpress.com/2017/04/fundamentals-of-data-structures-ellis-horowitz- sartaj-sahni.pdf
3. https://www.slideshare.net/canaokar/fundamentals-of-computer-algorithms-by-horowitz-sahni-rajsekaran

Pedagogy

Quiz, Assignment, Chalk-Talk, Power point Presentations, E-Content

Course Designer

Ms.K.Sangeetha

Semester IV	Internal Marks : 40			External Marks:60		
COURSE CODE	**COURSE TITILE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS4CC4P	**DATA STRUCTURES LAB USING C**	**CORE**	**45**	**-**	**3**	**3**

Objective

- To impart practical training on data structures using C
- To implement algorithms in real time environment
- To understand the efficiency of an algorithm based on the choice of data structure

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the basic concepts of data structure	K2
CO2	Write and debug linear and non linear data structure programs to represent real world problems	K3
CO3	Apply suitable data structure to design an algorithm in real time problems	K3
CO4	Construct Programs step-wise by defining functions and calling them	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	S	S
CO3	S	M	M	S
CO4	S	S	S	S

S-Strong; M-Medium; L-Low

Syllabus

1. Stack operations (PUSH & POP) using array
2. Queue operations (INSERT&DELETE) using array
3. Singly Linked list operations (INSERT,DELETE, SEARCH, COUNT) using pointer
4. Binary tree traversal using recursion
5. Sorting algorithms- Insertion sort, Bubble sort
6. Searching algorithms – Linear search, Binary search

Web References

1. https://www.programiz.com/c-programming
2. https://sites.google.com/site/itstudentjunction/lab-programming-solutions/datastructures-programs/data structures-lab-programs
3. http://enggedu.com/implemention_of_stack_using_array/index.php

Pedagogy

Power point Presentations, E-Content

Course Designer

Ms.K.Sangeetha

Semester IV	Internal Marks : 25		External Marks:75			
COURSE CODE	**COURSE TITILE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS4AC5	**MICROPROCESSOR AND MICROCONTROLLERS**	**ALLIED**	**45**	**3**	**-**	**3**

Objective

- To understand the architecture of 8085& 8051
- To impart the knowledge about the instruction set
- To develop skill in writing simple program for 8085 and its interfacing applications

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO 1	Understand the architecture of 8085 and 8051	K2
CO 2	Illustrate the knowledge about the instruction sets of 8085 & 8051	K2
CO 3	Distinguish between 8085 and 8051 architecture	K2
CO 4	Outline the functions of peripheral devices	K4
CO 5	Develop skill in simple program writing for 8085 and 8051 based systems	K6

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	L	S
CO2	S	M	M	S
CO3	S	S	M	S
CO4	M	M	M	S
CO5	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit-I : 8-bit Microprocessor (8085) (9 HOURS)

Microprocessor evolution and types, Microprocessor architecture and operations of its components, addressing modes, Interrupts, data transfer schemes, instruction and data flow, timer and timing diagram. Interfacing device.

Unit-II : Microprocessor Programming (9 HOURS)

Assembly language programming based on Intel 8085. Instructions, data transfer, arithmetic, logic, branch operations, looping, counting, indexing, programming techniques, counters and time delays, stacks and subroutines, conditional call and return instructions.

Unit-III: Simple Programs (10 HOURS)

8- bit Addition – 8-bit Subtraction – Multiplication and Division - BCD to Binary and Binary to BCD conversions –BCD to HEX and HEX to BCD conversions – Finding the largest and smallest number in a data array- sorting-sum of a series –Ascending and descending order – Subtraction using 1's complement and 2's complement.

Unit - IV: Peripheral Interfacing (9HOURS)

Peripheral Devices: 8237 DMA Controller - 8255 programmable peripheral interface - 8253/8254 programmable timer/counter - 8259 programmable interrupt controller - 8251 USART and RS232C.

Unit - V: Microcontroller (8051) (8 HOURS)

Comparison between microprocessor and microcontroller - Features of 8051 - Architecture - Pin configuration - Memory organization - External data and program memory - Addressing modes.

Text Books

S.No.	Author name	Title of the book	Publishers	Year of Publication	Edition
1.	Gaonkar,Ramesh S	Microprocessor Architecture, Programming and Applications with 8085	Pearson Education	1984	5th Edition
2.	B.Ram	Fundamental of Microprocessor and microcontroller	Dhanpat Rai Publications(P) Ltd, New Delhi	2013	8th Edition
3.	Muhammad Ali Mazidi,Janice Gillispie Mazidi, Rolin D. McKinlay	The 8051 Microcontroller and Embedded Systems	Prentice Hall of India, New Delhi.	2005	2nd Edition

Reference Books

S.No.	Author name	Title of the book	Publishers	Year of Publication	Edition
1.	A.Nagoorkani	Microprocessors & Microcontrollers	RBA Publications, Chennai	2012	2nd Edition
2.	A.P. Godse and D.A. Godse.	Microprocessors and Microcontrollers	Technical Publications,Pune	2017	4th Revised Edition

Pedagogy

Lecture, Seminar, Interaction, Assignment, Debate, power point presentation.

Course Designer

1.Ms.R.Ilavarasi

2. Ms. D.Devi

Semester IV	Internal Marks: 40			External Marks:60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS4NME2P	**MULTIMEDIA LAB**	**NME**	**30**	**-**	**2**	**2**

Objective

- To learn and understand technical aspect of Multimedia Systems
- To give an overall view of multimedia tools
- Explore various photo editing features, animation techniques and demonstrate proficiency in developing the multimedia presentations

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the basic tools and components of a multimedia	K1
CO2	Create simple shapes using animation editing software and design simple animation by applying shape tweens and motion tweens	K4
CO3	Apply basic elements and principles of photo editing software to achieve a great photo effect by applying effects like color, shadows, alteration of backgrounds, cropping and collage making	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	S	S
CO2	S	M	S	S
CO3	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

1. Create an animation to represent the Growing Moon in Flash.
2. Create an animation for bouncing a ball in Flash.
3. Change a Circle into a Square in Flash.
4. Display the Background image given through your name using mask in Flash.
5. Create the animation using Flash with the following features:

WELCOME

- Letter should appear one by one.
- The fill colour of the text should change to a different colour after the display of the full word.

6. Program to create an image and demonstrate basic image editing using photoshop.
7. 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.
8. 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.
9. Design a visiting card containing at least one graphic and text information in Photoshop.
10. Convert the given image to a pencil sketch.
11. Import two pictures, one that of sea and another of clouds. 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 Presentation, e-content.

Course Designer

Ms. N.Agalya

Semester IV	Internal Marks: 40			External Marks:60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS4SBE1AP	**PC PACKAGES & MULTIMEDIA LAB**	**SBE**	**30**	**-**	**2**	**2**

Objective

- To have a hands-on experience in MS Office
- To give an overall view of multimedia tools
- To understand and differentiate text, image
- To perform documentation, accounting operations and presentation skills

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Explain / Outline the concepts of MS Office – Word, Excel, Power Point	K2
CO2	Analyze /Recognize when to use each of the Ms Office programs to create professional and academic documents	K4
CO3	Use MS Office programs to create personal, academic and business documents following current professional and/or industry standards	K3
CO4	Explain / Outline the concepts of Multimedia	K2
CO5	Design and implement an animation for various themes and edit the images with the use of Multimedia	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	S	M
CO2	S	M	S	M
CO3	S	M	S	S
CO4	S	S	S	S
CO5	S	S	S	S

Syllabus

1. Open a new Ms Office document and perform the following operations in it.

i. Text Alignment
ii. Change type of font types and sizes
iii. Place a box to the entire text
iv. Add the bullets and numbering
v. Change line spacing to 1.5

2. Prepare an advertisement to a company with the following specifications

i. Attractive Page Border.

ii. Design the name of company using WordArt.

iii. Picture Insertion and Alignment

3. Perform Table Creation and Manipulation in Ms Word.

4. Perform mail merge in Ms Word.

5. Create the table in Ms Excel, Perform the Sorting, Filter and use formula editor.

6 .Draw a line, XY, bar and pie chart for a given user data in Ms Excel

7. Create a presentation on Tourism of a place using different template, colour schema and text formats

8. Create a presentation about your college and department using animations and sound effects Add

OLE object to your presentation.

9. Create an animation to represent the Growing Moon in Flash.

10. Change a Circle into a Square in Flash.

11. Display the Background image given through your name using mask in Flash.

12. Create the animation using Flash with the following features:

WELCOME

- Letter should appear one by one.
- The fill colour of the text should change to a different colour after the display of the full word.

13. Design a visiting card containing at least one graphic and text information in Photoshop.

14. Convert the given image to a pencil sketch.

15. Import two pictures, one that of sea and another of clouds. Morph, Merge and Overlap the images.

Web References

1. http://dte.kar.nic.in/STDNTS/CS%20IS/multimedia%20lab%20programs.pdf
2. https://www.adorama.com/alc/how-to-edit-your-photos-5-photoshop-editing-steps-for-beginners
3. https://www.gfmer.ch/Informatics/Presentations/postgrad2005/presentation.pdf
4. https://hschmidt.public.iastate.edu/wordtutorial.html

Pedagogy

Power point Presentation, e-content.

Course Designer

Ms. N.Agalya

Semester IV	Internal Marks: 40			External Marks:60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS4SBE1BP	**COMPUTER HARDWARE AND TROUBLE SHOOTING LAB**	**SBE**	**30**	**-**	**2**	**2**

Objective

- To provide knowledge in basic components of computer System
- To identify common problems/failures in a Computers
- To provide knowledge in repair/maintain a computer

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recall the fundamentals of computer components	K1
CO2	Explain the connection and functions of computer	K2
CO3	Predict the system problems	K3
CO4	Build the system with trouble shooting	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	S	S
CO2	S	S	S	S
CO3	S	S	S	S
CO4	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

1. Identifying the basic components of a Computer
2. Identifying Power supply connection and its function
3. Identifying Input and output devices
4. Identifying storage devices
5. Assembling a PC
6. Disassembling a PC
7. Installation procedure of operating system
8. Installation procedure of software
9. Hardware troubleshooting – BIOS problems, power Supply problems, Mother board Problems
10. Hardware troubleshooting – I/O devices problems, peripheral devices problems

Web References

1. https://www.your10.co.in/assemble-and-disassemble-computer-system/
2. https://youtu.be/PO7KBUHxrlU
3. https://www.computerhope.com/basic.htm
4. https://www.slideshare.net/mobile/katjeruls/computer-hardware-troubleshooting

Pedagogy

Power point Presentation, workshop, e-content.

Course Designer

Ms. N.Girubagari

Semester V	Internal Marks : 25			External Marks:75		
COURSE CODE	**COURSE TITILE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5CC5	**PYTHON PROGRAMMING**	**CORE**	**75**	**5**	**-**	**5**

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 Outcomes

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

CO Number	CO Statement	Knowledge Level
CO 1	Describe the basic built-in functions and syntax of Python programming	K1
CO2	Understand the concepts of arrays and file operations	K2
CO3	Use external libraries and packages with python	K3
CO4	Apply the concepts of decision making and construct statements	K3
CO5	Implementing database concepts	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	M	S
CO2	S	S	S	S
CO3	S	S	S	S
CO4	S	S	S	S
CO5	S	S	S	S

S-Strong; M-Medium; L-Low

Syllabus

UNIT – I **(13 HOURS)**

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.

UNIT – II **(17 HOURS)**

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.

UNIT – III **(15 HOURS)**

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.

UNIT –IV **(17 HOURS)**

Lists & Tuples - Dictionaries - Modules and Packages: Built-in Modules - Creating Modules - import Statement - Locating Modules - Namespaces and Scope - The dir() function - The reload() function - Packages in Python.

UNIT – V **(13 HOURS)**

Files in Python - Python's database connectivity - Types of database used with Python -Working with MySQL database - Using MySQL from Python - Creating database tables through Python.

Text Books

S.No.	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Dr.R.Nageswara Rao	Core Python Programming	Dreamtech Press	2017
2	Jeeva Jose &P.Sojan Lal	Introduction to Computing and Problem Solving with PYTHON	KHANNA Book Publishing Co.(P).Ltd	2016

Reference Books

S.No.	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1	Eric Matthes	Python crash course	William Pollock , 2nd edition	2019
2	Allen B. Downey	Think Python	O'Reilly Publishers, 2nd edition	2015
3	Mark Lutz	Python Pocket Reference	O'Reilly Media	2014
4	Wesley J. Chun	Core Python Programming	Prentice Hall	2009

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/

Pedagogy

Assignment, Seminar, Lecture, Quiz, Group discussion, Power point presentations

Course Designer

Ms. K.Reka

Semester V	Internal Marks : 40			External Marks:60		
COURSE CODE	**COURSE TITILE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5CC5P	**PYTHON PROGRAMMING LAB**	**CORE**	**45**	**-**	**3**	**3**

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

Course Outcomes

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

CO Number	CO Statement	Knowledge 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 MySql	K3
CO5	Construct Python programs step-wise by defining functions and calling them	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	S	S
CO3	S	S	S	S
CO4	S	M	M	S
CO5	S	S	S	S

S-Strong;M-Medium; L-Low

Syllabus

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. Exception Handling
8. File Operations
9. Working with MySql
10. Matplotlib pyplot

Web References

1. https://www.w3resource.com/python-exercises/
2. https://cocalc.com/
3. http://machinelearningplus.com
4. https://www.programiz.com/python-programming/online-compiler/
5. https://www.codechef.com/ide

Pedagogy

Power point presentations, e-content

Course Designer

Ms. K.Reka

Semester V	Internal Marks : 25			External Marks:75		
COURSE CODE	**COURSE TITILE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5CC6	**COMPUTER GRAPHICS**	**CORE**	**75**	**5**	**-**	**4**

Objective

- To understand the basics of Graphical Mechanisms
- To have a knowledge about display and I/O devices
- To gain knowledge about 2D and 3D Transformations and Techniques

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the basic attributes of various output primitives	K1
CO2	Explain about the basic principles of Graphics systems	K2
CO3	Describe various input techniques and Methods	K2
CO4	Apply algorithm to draw different mathematical objects	K3
CO5	Illustrate various 2D & 3D Geometric & modeling Techniques	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	M	S
CO2	S	M	M	S
CO3	S	S	S	S
CO4	S	S	S	S
CO5	S	S	S	S

S-Strong, M-Medium, L- Low

Syllabus

UNIT I **(12 HOURS)**

Overview of Computer Graphics System: Video Display Devices – Raster Scan Systems – Random – Scan Systems - Graphics Monitors and Workstations – Input Devices – Hardcopy Devices – Graphics Software.

UNIT II **(15 HOURS)**

Output Primitives: Line Drawing Algorithms – Loading the Frame Buffer – Line Function – Circle – Generating Algorithms. Attributes of Output Primitives: Line Attributes – Curve Attributes – Color and Grayscale levels– Area fill Attributes – Character Attributes – Bundled Attributes – Inquiry Functions.

UNIT III **(18 HOURS)**

2D Geometric Transformations: Basic Transformation – Matrix Representations – Composite Transformations – Window to View port Co-Ordinate Transformations. Clipping: Point Clipping – Line Clipping – Cohen-Sutherland Line Clipping — Polygon Clipping – Sutherland-Hodgeman Polygon Clipping – Curve Clipping – Text Clipping.

UNIT IV **(12 HOURS)**

Graphical User Interfaces and Interactive Input Methods: The User Dialogue – Input of Graphical Data – Input Functions – Interactive Picture Construction Techniques. Three Dimensional Concepts: 3D-Display Methods –Three Dimensional Graphics Packages

UNIT V **(18 HOURS)**

3D Geometric and Modelling Transformations: Translation – Scaling – Rotation – Other Transformations. 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.

Text Book

S.No	Author	Book Title	Publication	Year
1.	Donald D.Hearn M. Pauline Baker	Computer Graphics C Version	Pearson Education,2nd Edition	2014

Reference Book

S.No	Author	Book Title	Publication	Year
1.	Sunil Kumar Sharma, Manoj Singhal	Computer Graphics	Pearson Education	2014
2.	William M. Neuman, Robert R. Sprout	Principles of interactive Computer Graphics	McGraw Hill International Edition	2000
3.	Computer Graphics	Udit Agarwal	S.K. Kataria & Sons	2013

Web References

1. www.tutorialspoint.com
2. http://math.hws.edu/graphicsbook
3. https://www.researchgate.net/publication/340315732_Lecture1_Computer_Graphics_Introduction
4. http://www.svecw.edu.in/Docs%5CCSECGLNotes2013.pdf
5. https://www.amazon.com/Computer-Graphics-Principles-Practice-2nd/dp/0201848406

Pedagogy

Quiz, Assignment, Chalk-Talk, Power point Presentations, E-Content

Course Designers 1.Ms.A.Sahaya Jenitha

Semester V	Internal Marks:25			External Marks:75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5CC7	**COMPUTER NETWORKS**	**CORE**	**90**	**6**	**-**	**5**

Objective

- To provide the basics in computer network concepts
- To interpret the layering concepts in computer networks
- To educate the knowledge about networking technologies

Course Outcomes

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

CO Number	Course Outcome	Knowledge Level
CO1	Describe the basics of data communication	K1
CO2	Identify the different types of network topologies and the layers of OSI model.	K1
CO3	Explain contemporary issues in networking technologies	K2
CO4	Illustrate about Internetworking	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	S	S
CO2	S	M	S	S
CO3	S	S	S	S
CO4	S	S	S	S

S-Strong, M-Medium, L- Low

Syllabus

UNIT I **(17 HOURS)**

Introduction to Data Communications and Networking: Introduction – Fundamental Concepts – Data Communications – Protocols – Standards –Standards Organization- Signal Propagation-Analog and Digital Signals. Analog and Digital Transmission Methods: Analog Signal, Analog Transmission – Digital Signal, Digital Transmission- Digital Signal, Analog Transmission. Modes of Data Transmission and Multiplexing: Parallel and Serial Communication.

UNIT II **(20 HOURS)**

Transmission Errors: Detection and Correction: Introduction – Error Classification – Types of Errors – Error Detection. Transmission Media: Guided Media – Unguided Media. Network Topologies, Switching and Routing Algorithms – Networking Protocols and OSI Model: The OSI Model – OSI Layer Functions.

UNIT III **(22 HOURS)**

LAN, MAN, WAN: LAN – Ethernet-Token Ring- Fiber Distributed Data Interface-MAN – WAN-WAN Architecture. Medium Access Sublayer and ISDN: Static and Dynamic Channel Allocation – Medium Access Control (MAC) Sublayer – Classification and Study of MAC Sublayer Protocols/Collisions – ISDN and its Background-ISDN Architecture-ISDN Interface. Frame relay and Congestion Control: How Frame Relay Works-Congestion Control – ATM.

UNIT IV **(16 HOURS)**

Internetworking Concepts: Internetworking- The Problems in Internetworking – Dealing with Incompatibility Issues–A Virtual Network- Internetworking Devices – Repeaters –Bridges – Routers-Gateways.TCP/IP : TCP/IP Basics-IP Address –Features of TCP-Connections: Passive Open and Active Open – UDP-UDP Packet –Difference between UDP and TCP.

UNIT V **(15 HOURS)**

Domain Name System – E-mail – File Transfer Protocol – The Basics of WWW and Browsing – Hypertext Mark-up Language – Web Browser Architecture – Remote Login(TELNET) – Static, Dynamic and Active Web Pages.

Text Book

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1.	Achyut S Godbole and AtulKahate	Data Communications and Networks	Tata McGraw-Hill Education Private Ltd, 2nd Edition	2017

Reference Books

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1.	Andrew S Tanenbaum, David J.Wetherall	Computer Networks	Pearson Education Publications, 5thEdition	2013
2.	C.R.Sharma	Computer Networks	Jaico Publishing House, 1stedition	2005

Web References

1. https://www.tutorialspoint.com/data_communication_computer_network/index.htm
2. https://www.guru99.com/data-communication-computer-network-tutorial.html
3. https://www.studytonight.com/computer-networks/

Pedagogy

Quiz, Assignment, Chalk-Talk, Power point Presentations, E-Content

Course Designers

1.Ms.R.Sangeetha

Semester V	Internal Marks : 25			External Marks: 75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5MBE1A	**COMPUTER ARCHITECTURE**	**MBE**	**75**	**5**	**-**	**4**

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

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Describe the basic structure of computer	K1
CO2	Express computer arithmetic operations	K2
CO3	Demonstrate the control unit operations	K3
CO4	Analyse the concept of IO organization	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	S	M
CO2	S	S	S	S
CO3	S	M	S	S
CO4	S	M	S	M

S-Strong, M-Medium, L- Low

Syllabus

UNIT – I **(15 HOURS)**

Basic Computer and Organization Design: Operational concepts-Instruction Codes- Registers-Instructions-Memory locations-Memory Address-Instruction Cycle-Timing Signal-Control signal-bus organization

UNIT- II **(15 HOURS)**

General Register Organization: Stack Organization-Addressing modes-Instruction classification-Program control.

UNIT- III **(18 HOURS)**

Memory Organization: Hierarchy-Main memory-Organization of RAM-SRAM-DRAM-ROM-PROM-EPROM-EEPROM-Auxiliary Memory-Cache Memory-Virtual Memory-Mapping Techniques.

UNIT-IV **(15 HOURS)**

Parallel Computer Structures: Introduction to parallel processing-pipeline computers-Multi

processing systems-SISD-SIMD-MISD-MIMD.

UNIT-V **(12 HOURS)**

Pipelining and Vector Processing: Introduction to Pipelining- Vector Processing-Array Processors.

Text Book

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1.	Computer System Architecture	M. Morris Mano	Pearson India,Revised 3rd Edition	2019
2.	Computer Architecture and parallel processing	Kai Hwang,FA Briggs	Tata McGraw Hill	2017

Reference Books

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1.	Computer Organization	Carl Hamacher	Tata McGraw Hill,5th Edition	2011
2.	Computer Architecture and Organization	John P Hayes	Tata McGraw Hill,5th Edition	2017
3.	Computer Organization and Architecture	William Stallings	Pearson Education,10th Edition	2016

Web References

1. https:// en.wikipedia.org
2. https:// home.ustc.edu.cn
3. https:// ict.iitk.ac.in
4. www.geeksforgeeks.org

Pedagogy

Quiz, Assignment, Chalk-Talk, Power point Presentations, E-Content

Course Designer

1.Ms.D.Radhika

Semester V	Internal Marks : 25			External Marks:75		
COURSE CODE	**COURSE TITILE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5MBE1B	**SOFTWARE ENGINEERING**	**MBE**	**75**	**5**	**-**	**4**

Objective

- To provide knowledge of the various phases of Software Engineering Process
- To study the basic concepts of Software Systems, Development process and Planning Structures
- To understand how to estimate cost and its specification Techniques
- To inculcate knowledge on Design, Testing , Verification and Validation techniques

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Describe about Software engineering concepts and process	K1
CO2	Recall the importance on Measurement & Metrics	K1
CO3	Identify various software computing cost	K2
CO4	Discuss on software Implementation and Maintenance	K2
CO5	Illustration on software design and modules	K3
CO6	Demonstrate the subject knowledge on coupling, cohesion and testing strategies	K3
CO7	Describe about Emerging Trends in Web Engineering, Cloud Computing, open source	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	S	S
CO3	S	S	S	S
CO4	S	S	S	S
CO5	S	S	S	S
CO6	M	S	S	S
CO7	M	S	S	S

S-Strong, M-Medium, L- Low

Syllabus

UNIT I : INTRODUCTION (15 HOURS)

Introduction – Definitions-Size Factors-Quality and Productivity factors –Product- Process. Planning a Software Project-Introduction-Defining the Problem-Developing a Solution Strategy-Planning the Development Process-Planning an Organizational Structure-other Planning Activities.

UNIT II : REQUIREMENTS ANALYSIS MODELING (15 HOURS)

Software Cost Estimation-Cost Factors-Cost Estimation Techniques-Staffing level Estimation – Estimating Software Maintenance Costs. Software Requirement Specification-Formal Specification Techniques.

UNIT III : SOFTWARE DESIGN (18 HOURS)

Software Design-Fundamental Design Concepts-Modules and Modularization Criteria –Design Notations – Design Techniques - Detailed Design Considerations - Real time and Distributed System design - Test Plans - Milestones, Walkthroughs and Inspections –Design Guidelines.

UNIT IV : SOFTWARE CODING (15 HOURS)

Introduction to Software Measurement and Metrics - Software Configuration – Project Management Introduction- Introduction to Software Testing-Software Maintenance

UNIT V : WEB ENGINEERING (12 HOURS)

Introduction to Web - General Web Characteristics - Web Application Categories - Working of Web Application - Advantages and Drawbacks of Web Applications - Web Engineering - Emerging Trends in Software Engineering - Web 2.0 - Rapid Delivery - Open Source Software Development - Security Engineering - Service Oriented Software Engineering - Web Service - Software as a Service - Service Oriented Architecture - Cloud Computing - Aspect Oriented Software Development - Test Driven Development - Social Computing

TextBooks

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1.	Richard Fairley	Software Engineering Concepts	TMH	2008
2.	Chandramouli Subramanian, SaikatDutt, Chandramouli Seetharaman, B.G.Geetha (UNIT V)	Software Engineering	Pearson Publications	2015

Reference Books

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1.	Roger S.Pressman, Bruce R.MAXTM	Software Engineering: A Practitioner's Approach	MGH publishers , 6th Edition	2017
2.	Jibitesh Mishra	Software Engineering	Pearson Education	2011
3.	Ian Sommerville	Software Engineering	9th Edition, Pearson Education Asia	2011

4.	Pankaj Jalote	Software Engineering	A Precise Approach", Wiley India	2010

Web References

1. https://www.academia.edu/4660479/an_integral_approach_to_software_engineering
2. https://link.springer.com/content/pdf/bfm%3A978-1-4684-9312-2%2F1.pdf
3. http://nptel.ac.in/
4. http://www.ddegjust.ac.in/studymaterial/mca-5/mca-303.pdf
5. http://bigbluebutton13.unisepe.com.br/cgi/viewcontent.php?article=software.engineering

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

Ms.A.Sahaya Jenitha

Semester V	Internal Marks : 25					External Marks: 75
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5MBE1C	**CYBER SECURITY**	**MBE**	**75**	**5**	**-**	**4**

Objective

- To understand the difference between threat, risk, attack and vulnerability
- Analyze how threats materialize into attacks and the motivations behind them
- Exhibit knowledge to secure corrupted systems, protect personal data and secure computer networks in an organization

Course Outcome

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

CO Number	CO Statement	Knowledge Level
CO1	Understand threat, risk, attack and motivations behind them	K2
CO2	Design and develop secured architecture for an organization	K3
CO3	Determine software vulnerabilities to reduce the risk of exploitation	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	**S**	**S**	**S**	**M**
CO2	**S**	**S**	**S**	**S**
CO3	**S**	**S**	**S**	**M**

S– Strong; M–Medium; L –Low

Syllabus

UNIT –I (15 HOURS)

Introduction: History of Internet – Introduction to Cyber crime- Malware and its type – Kinds of Cyber Crime – Authentication- Encryption- Digital Signature- Antivirus-Vulnerability-NamingSchemes and Security Configuration Settings – The attacker's Motivation and Tactics – Zero-Day Vulnerabilities

UNIT –II (15 HOURS)

Overview-Unified Threat Management – Firewalls – Stateless Packet Filtering – Stateful / Session Filtering – Application Level Gateways – Circuit Level Gateways – A comparison of four types of firewalls – The Architecture for a Primary-Backup Firewall – Configuring Firewall on MAC

computer – Working with Windows Firewall as a Personal Firewall – The Cisco Firewall as an Enterprise Firewall – The small Office /Home Office Firewall – Emerging Firewall Technology

UNIT –III **(15 HOURS)**

Generating secure password – Using Password Manager – Enabling Two Step Verification – Hash and Authentication: Authentication Overview – Hash Functions – The Hash Message Authentication Code- Password Based Authentication – Password based Security Protocol – The One Time Password and Token – Open Identification(OpenID) and Open Authorization (OAuth)

UNIT – IV **(15 HOURS)**

Safe Browsing – Finding the best browser according to the users requirement- clearing cache for browsers – Wireless LAN-Major issues with WLAN – Safe browsing Guidelines for social networking sites – Email Security Tips – Smartphone Security Guidelines: Purses, Wallets, Smart phones – Platforms, setup and Installation – Communicating Securely (Through Voice and Messages) with a smart phone

UNIT – V **(15 HOURS)**

Cyber Threats and Their Defense: Domain Name System (DNS) Protection – Router Security – Spam / Email Defensive measures – Phishing Defensive Measures – Web Based Attacks – Database Defensive Measures – Botnet Attacks and Applicable Defensive Techniques

Text Books

S. No	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Dr. Jeetendra Pande	Introduction to Cyber Security	Uttarakhand Open University	2017
2	Chwan-Hwa (John)Wu J.David Irwin	Introduction to Computer Networks and Cyber Security	CRC Press	2013

Reference Books

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	James Graham Richard Howard Ryan Olson	Cyber Security Essentials	CRC Press	2011
2	Nina Godbole Sunit Belapure	Cyber Security	Wiley India	2011

Web References

1. http://www.uou.ac.in/sites/default/files/slm/Introduction-cyber-security.pdf
2. http://www.bandido.ch/programming/Cyber_Security_Essentials.pdf
3. https://www.youtube.com/watch?v=PlHnamdwGmw
4. https://www.youtube.com/watch?v=U_P23SqJaDc

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment

Course Designer

Ms.R.Ramya

Semester V	Internal Marks:40			External Marks:60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5SBE2AP	**MOBILE APPLICATION DEVELOPMENT LAB**	**SBE**	**30**	**-**	**2**	**2**

Objective

- To understand the components and structure of mobile application development frameworks for Android and windows OS based mobiles
- To understand how to work with various layouts in mobile application development
- To implement in real time environment

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Install and configure Android application development tools	K1
CO2	Analyze and discover own mobile app for simple needs	K3
CO3	Deploy applications to hand held devices	K5

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	S	S
CO3	S	S	S	S

S-Strong, M-Medium, L- Low

Syllabus

1. Develop an application that uses Layout Managers and event listeners.
2. Develop an application to change Font and Colors of an object.
3. Develop a native calculator App.
4. Develop a Rating App.
5. Implement an application that creates an alert upon receiving a message.
6. Implement an application that implements Multi threading.
7. Implement Content provider for student database.

Web References

1. www.codeconnect.com

Pedagogy

Power point Presentations, E-Content

Course Designer

1. Dr.P.Rajeswari

Semester V	Internal Marks:40			External Marks:60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5SBE2BP	**COMPUTER NETWORKS LAB USING JAVA**	**SBE**	**30**	**-**	**2**	**2**

Objective

- Learn socket programming
- Have hands on experience on ARP protocols
- To implement RPC

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concept of networking	K1
CO2	Implement the socket programming for client server architecture	K2
CO3	Illustrate various protocols implementation	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	M	S	S
CO3	S	S	S	S

S-Strong, M-Medium, L- Low

Syllabus

1. Study of Socket Programming and Client – Server model
2. Write a code simulating ARP protocols using TCP
3. Write a code simulating PING and TRACEROUTE commands
4. Create a socket HTTP for web page upload and download
5. Write a program to implement RPC (Remote Procedure Call)

Web References

1. https://www.javatpoint.com/socket-programming
2. https://srikarthiks.files.wordpress.com/2019/07/nw-lab_arp.pdf
3. https://www.darkwebcode.com/2020/04/create-socket-for-http-for-web-page-upload-and-download.html
4. http://drranurekha.com/network-programming-2/

Pedagogy

Power Point Presentations

Course Designer

Ms.R.Rita Jenifer

Semester V	Internal Marks : 40			External Marks:60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5SBE3AP	**SOFTWARE TESTING TOOL – SELENIUM**	**SBE**	**30**	**-**	**2**	**2**

Objective

- To understand why we need automation testing
- To understand the essential characteristics of a Selenium tool used for test automation
- To easily build, enhance, and maintain scripts using both the Selenium IDE and Web drivers

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	State how to install and run open-source software testing tool Selenium	K1
CO2	Understand Selenium tool to perform testing	K2
CO3	Prepare test suits for different applications	K3
CO4	Use test suits and test simple programs	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	S	S
CO2	S	S	S	S
CO3	S	S	S	S
CO4	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

1. Install Selenium IDE and write a test suite containing minimum 4 test cases.
2. Install Selenium Webdriver and demonstrate it using a script in Java/PHP.
3. Write a program to enter student's six subject marks list and check whether passed or failed. Display the highest score.
4. Write a program to get elements from a webpage using different Locators
5. Write a program to check Logo Image for a webpage.
6. Write and test a program to login a specific webpage.
7. Write and test a program to register for a particular webpage
8. Take screenshot of a specific webpage
9. Write a program to upload a file in selenium
10. Write and test a program to provide total number of objects present / available on the page.

11. Open ended Experiment: Mini Project – Not for exam but to compulsory to be included in Record. (Test cases for Admission form / Shopping cart / Travel Booking / Hotel Booking / Utility Bill Payment.)

Web References

1. https://www.shroffpublishers.com/books/9789350237120/
2. https://www.selenium.dev/documentation/en/legacy_docs/selenium_ide/
3. https://stackabuse.com/web-browser-automation-with-selenium-and-java/
4. https://selenium-python.readthedocs.io/
5. https://testng.org/doc/selenium.html
6. https://www.selenium.dev/

Pedagogy: Demonstration

Course Designer : Ms.V.Kavitha

Semester V	Internal Marks : 40			External Marks:60		
COURSE CODE	**COURSE TITILE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS5SBE3BP	**COMPUTER GRAPHICS LAB USING C**	**SBE**	**30**	**-**	**2**	**2**

Objectives

- To understand the basic concepts of Computer Graphics
- To understand the concepts of different type of text formatting and drawing using simple functions
- To understand the pixel activation techniques using different algorithms
- To understand the concepts of different type of geometric transformation of objects in 2D

Course Outcomes

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

CO Number	CO statement	Knowledge level
CO1	Recall the basics of computer graphics.	K1
CO2	Describe pixel activation with algorithms	K2
CO3	Apply different text formatting using graphic functions and 2D transformations of an object.	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	M	S	M
CO2	S	S	S	S
CO3	S	M	S	S

S-Strong, M-Medium, L- Low

Syllabus

1. Write a C-Program to draw a line segment between two given points using DDA algorithm.
2. Write a C program for determining pixel activation list between two given points in order to draw line segment using Bresenham's Line drawing algorithm.
3. Write a C Program to generate pixel activation list for drawing a circle with a given centre of circle P(x, y) and a radius r.
4. Write a C program for displaying text in different sizes, different colours, different font styles.
5. Write a C-program for performing the basic 2D transformations such as translation,Scaling and Rotation for a given 2D object
6. Write a C Program for drawing simple two dimensional objects (Circle, Ellipse…..).

   i) House ii)Car iii) Fish

Web References

1. https://www.geeksforgeeks.org/dda-line-generation-algorithm-computer-graphics/
2. https://www.javatpoint.com/computer-graphics-bresenhams-line-algorithm
3. https://educatech.in/cprogram-which-generates-pixel-activation-list-for-drawing-the-following-simple-two-dimensional-objects/
4. https://educatech.in/c-program-for-displaying-text-in-different-sizes-different-colors-different-font-styles/
5. http://meansofmine.blogspot.com/2011/04/c-program-for-2d-transformations-such.html

Pedagogy

Power point Presentations

Course Designer

1.Ms.S.UdhayaPriya

Semester VI	Internal Marks: 25			External Marks:75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS6CC8	**OPERATING SYSTEMS**	**CORE**	**90**	**6**	**-**	**5**

Objective

- To provide the fundamental concepts in an Operating System
- To analyze Scheduling algorithms
- To analyze various memory management schemes
- To understand I/O management and File systems

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	State the basic concepts of operating system and its components	K1
CO2	Explain the concepts of Memory allocation Schemes	K2
CO3	Apply different process scheduling algorithms to minimize the waiting time	K3
CO4	Analyze the various file management techniques	K3
CO5	Classify the various types of Device	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	M
CO2	S	S	M	M
CO3	S	S	S	S
CO4	M	M	M	M
CO5	S	S	M	M

S–Strong; M–Medium; L –Low

Syllabus

Unit I: **(12 HOURS)**

Introduction to Operating System: Operating System-Operating System Software -A Brief Historyof Machine Hardware -Types of Operating Systems -Brief History of Operating System Development-Object-Oriented Design of Operating System

Unit II: **(22 HOURS)**

Memory Management: Early Systems: Single-User Contiguous Scheme -Fixed Partitions-Dynamic Partitions- Best-Fit versus First-Fit Allocation -Deallocation - Relocatable Dynamic Partitions. Virtual Memory: Paged Memory Allocation-Demand Paging-Page Replacement Policies and Concepts - Segmented Memory Allocation-Segmented/Demand Paged Memory Allocation

Unit III : **(22 HOURS)**

Processor Management: Overview-About Multi-Core Technologies-Job Scheduling Versus Process Scheduling-Process Scheduler-Process Scheduling Policies-Process Scheduling Algorithms - Interrupts-Deadlock-Seven Cases of Deadlock -Conditions for Deadlock-Modeling Deadlock- Strategies for Handling Deadlocks –Starvation

Unit IV: **(20 HOURS)**

Device Management: Types of Devices-Sequential Access Storage Media-Direct Access Storage Devices- Magnetic Disk Drive Access Times- Components of the I/O Subsystem- Communication among Devices-Management of I/O Requests

Unit V: **(14 HOURS)**

File Management: The File Manager -Interacting with the File Manager -File Organization - Physical Storage Allocation -Access Methods-Levels in a File Management System - Access Control Verification Module

Text Book

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Ann McIver McHoes, Ida M. Flynn	Understanding Operating Systems	Course Technology, Cengage Learning	2011

Reference Books

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Achyut God bole , Atul Kahate	Operating Systems	McGraw Hill Publishing	2010
2	Abraham Silberschatz, Peter B. Galvin , Greg Gagne	Operating System Concepts	John Wiley & Sons, Inc.	2018

Web References

1. https://nptel.ac.in/content/storage2/courses/106108101/pdf/Lecture_Notes/Mod%201_LN.pdf
2. https://www.tutorialspoint.com/operating_system/
3. https://www.studytonight.com/operating-system/deadlocks
4. http://faculty.salina.k-state.edu/tim/ossg/Device/Device.html
5. https://medium.com/@princeabhishek410/understanding-file-management-system-in-operating-system

Pedagogy

Chalk and talk, PPT, E-Content

Course Designer

Ms. K.Pradeepa

Semester VI	Internal Marks : 25			External Marks:75		
COURSECODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS6CC9	**WEB TECHNOLOGY**	**CORE**	**90**	**6**	**-**	**5**

Objective:

- To learn the fundamentals of web designing
- To design and develop standard and interactive web pages
- To learn some popular web scripting languages

Course Outcomes:

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

CO Number	CO Statement	Knowledge Level
CO1	Analyze and design a static webpage by applying HTML elements.	K3
CO2	Develop a dynamic webpage by the use of JavaScript and DHTML.	K3
CO3	Analyze and use appropriate Client-side or Server-side applications	K3
CO4	Understand any suitable real time web application	K2

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4
CO1	M	S	S	S
CO2	S	S	S	S
CO3	M	S	S	S
CO4	S	S	S	S

S– Strong; M–Medium; L – Low

Syllabus

UNIT I **(17 HOURS)**

Introduction to HTML – **Lists:** Types of Lists – **Adding Graphics to HTML Documents**: Using the Border, Width and Height, Align and Alt Attribute – **Tables:** Using the Width and Border, Cellpadding, Cellspacing, Background-Color Property and Colspan, Rowspan Attribute – **Linking Documents**: Links – Images as Hyperlinks – **Frames:** Introduction to Frames

UNIT II **(19 HOURS)**

Introduction to JavaScript: JavaScript in Web Pages –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 – **The JavaScript Document Object Model:** Introduction – the JavaScript Assisted Style Sheets DOM – Understanding Objects in HTML – Browser Objects – The Web Page HTML Object Hierarchy – Handling Events

UNIT III **(14 HOURS)**

Forms Used by a Website: The Form Object – Other Built-in Objects in JavaScript – User Defined Objects – **Cookies:** What are Cookies – Setting a Cookie **– Dynamic HTML:** CSS – Class – Using the tag – External Style sheets – Using the tag

UNIT IV **(18 HOURS)**

PHP : Getting Started – **The Basics of PHP:** Data types – Variables – Constants – Here Documents – Operators – Arrays – Conditional Statements – Iterations – **Functions:**User Defined Functions – Built – in Functions – Working with Date and Time – Performing Mathematical Operations – Working with string Functions.

UNIT V **(22 HOURS)**

Common Gateway Interface: Server-Browser Interaction – CGI Script Structure – The CGI.pm Module – Perl Variables – CGI Environment Variables – Processing Forms – Sending Mail – Validating the Form Data – Handling Checkboxes – Server Side Include – CGI Server Side and Client Side Applets – CGI Security Issues – **Servlets:** Advantages of Servlets over CGI **–** Installing Servlets – The Servlet Life Cycle – Servlet API – A simple Servlet – Handling HTTP GET Requests and POST Requests – **Java Server Pages**: Advantages of JSP – Developing First JSP – Components of JSP – Reading Request Information – Retrieving the Data Posted from a HTML file to a JSP File – JSP Sessions

Text Books:

S.No	AUTHOR	TITLE	PUBLISHER / EDITION	YEAR OF PUBLICATION
1.	Ivan Bayross	Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP (for Unit I- IV)	BPB Publications, 4th Revised Edition	2015
2	N.P.Gopalan and J.Akilandeswari	Web Technology – A Developer's Perspective (for Unit V)	Prentice Hall of India Private Ltd. 2nd Revised Edition	2014

Reference Books:

S.No	AUTHOR	TITLE	PUBLISHER / EDITION	YEAR OF PUBLICATION
1.	Robert W.Sebesta	Programming with World Wide Web	Pearson Education, 4th Edition	2011
2.	Paul Deitel, Harvey Deitel& Abbey Deitel	Internet & World Wide Web	Pearson Education 5th Edition	2019
3.	Jeffrey C.Jackson	Web Technologies :A Computer Science Perspective	Pearson Education	2015

Web References:

1. https://www.tutorialspoint.com/web_developers_guide/web_basic_concepts.htm
2. https://www.geeksforgeeks.org/web-technology/
3. https://www.halvorsen.blog/documents/programming/web/web.php

Pedagogy:

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer:

Ms.R.Sangeetha

Semester VI	Internal Marks: 25			External Marks:75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS6MBE2A	**CLOUD COMPUTING**	**MBE**	**90**	**6**	**-**	**5**

Objective:

- To give students an insight into the basics of Cloud Computing
- To provide the students basic architecture of Cloud Computing and virtualization
- To inculcate the Cloud Computing Technologies

Course Outcomes:

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

CO Number	CO Statement	Knowledge Level
CO1	Classify the concepts of Cloud deployment Models	K2
CO2	Apply the Virtualization Technologies	K3
CO3	Examine basic terminologies in service oriented architecture and cloud security	K4
CO4	Elucidate the applications of Cloud Computing	K4
CO5	Expose the concept of Cloud Computing Technologies, Platforms and Services	K4

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4
CO1	**S**	**S**	**S**	**S**
CO2	**S**	**S**	**M**	**S**
CO3	**S**	**S**	**M**	**S**
CO4	**S**	**S**	**M**	**S**
CO5	**S**	**S**	**S**	**S**

S– Strong; M–Medium; L – Low

Syllabus:

UNIT – I: (16 HOURS)

Foundation of Cloud Computing: Objectives – Introduction – Fundamentals – Cloud Computing characteristics – Advantages and Disadvantages – Comparison. Cloud services and Deployment Models: Cloud Deployment models – Cloud Service models – Cloud Infrastructure Mechanism.

UNIT – II: (20 HOURS)

Cloud Computing Architecture: Cloud Computing Architecture Design Principles – Cloud Computing Life Cycle – Cloud Computing Reference Architecture – Load Balancing Approach – Mobile Cloud computing. Virtualization Technology: Understanding Virtualization – Adopting Virtualization – Techniques of Virtualization – XEN – KVM – VMware – Virtual Box – Citrix – Types – Virtualization in cloud.

UNIT – III: **(18 HOURS)**

Service Oriented Architecture: Foundation – Web Services and SOA – Communication – Components – Infrastructure – Need of SOA – BPM. Cloud Security: Cloud Security – Cloud CIA Security Model – Architecture – Cloud Legal Issues - Data Security in Cloud – Cloud Risk Management Framework – Risk Management process for Cloud consumers.

UNIT – IV: **(18 HOURS)**

Threats in Cloud – Security techniquesfor threat protection – Components of SLA – Types of SLA.Cloud Computing Applications: Introduction – GAE – Google Apps – Google Cloud Data store – Dropbox Cloud – Apple iCloud – Microsoft windows Azure Cloud – Amazon Web Services.

UNIT – V: **(18 HOURS)**

Cloud Computing Technologies, Platforms and Services: MPI – Dryad – Eucalyptus – Open Nebula – OpenStack – Nimbus -Hadoop and Cloud. Adoption of Cloud Computing : Factors – Existing area applications – Case studies.

Text Book:

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Kamal Kant Hiran, RuchiDoshi, Dr. FagbolaTemitayo & Mehul Mahrishi	Cloud Computing	BPB Publication	2019

Reference Books:

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Ricardo Puttini, Thomas Erl, and Zaigham Mahmood	Cloud Computing: Concepts, Technology & Architecture	Prentice Hall	2013
2	Judith S. Hurwitz, Daniel Kirsch ·	Cloud Computing For Dummies	Wiley	2020

Web References:

1. https://www.tutorialspoint.com/cloud_computing/cloud_computing_tutorial.pdf
2. https://resources.sei.cmu.edu/asset_files/Presentation/2010_017_001_23337.pdf
3. https://www.geeksforgeeks.org/service-oriented-architecture/
4. https://www.javatpoint.com/what-is-cloud-security
5. https://www.simplilearn.com/cloud-computing-tutorial-video

Pedagogy:

Power point Presentations

Course Designer:

Ms.P. Muthulakshmi

Semester VI	Internal Marks : 25			External Marks:75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS6MBE2B	**FUNDAMENTALS OF BIG DATA & IOT**	**MBE**	**90**	**6**	**-**	**5**

Objective

- To provide a strong foundation about basic concepts of Big Data
- To understand the components of Hadoop framework, HDFS and MapReduce
- To inculcate Big Data analytics tools
- To understand the application areas of IoT and its levels
- To understand the building blocks of Internet of Things and characteristics.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Big Data	K2
CO2	Analyze the Hadoop framework	K4
CO3	Elucidate the application areas of the Internet of Things	K3
CO4	Explore the building blocks of IoT	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	**S**	**S**	**S**	**S**
CO2	**S**	**S**	**S**	**S**
CO3	**S**	**S**	**S**	**M**
CO4	**S**	**S**	**S**	**M**

S – Strong; M – Medium; L – Low

Syllabus

Unit I **(15 HOURS)**

Overview of Big Data: Big Data –Defining Big Data – Big Data Types – Analytics – Industry Examples of Big Data – Big Data and Data Risk – Big Data Technologies –The Benefits of Big Data

Unit II **(21 HOURS)**

Basics of Hadoop: BigData and Hadoop – Hadoop Architecture – Main Components of Hadoop Framework – Analyzing Big Data with Hadoop –Advantages of Hadoop – Ten Big Hadoop Platforms. Hadoop Distributed File System: HDFS– Architecture of Apache Hadoop HDFS- Other File Systems – HDFS File Blocks – HDFS File Commands.

Unit III **(18 HOURS)**

MapReduce: Introduction to MapReduce– Working of MapReduce – Map operations – A MapReduce Program-Map Reduce User Interfaces. HBase and Cassandra: Introduction to HBase – Row Oriented vs. Column Oriented Data Stores – HDFS vs HBase - HBase Architecture – HBase Data Model – Introduction to Cassandra – Features of Cassandra- Cqlsh commands

Unit IV **(18 HOURS)**

Introduction – Overview of Internet of Things –Characteristics of IoT- IoT Applications- Working and Implementation of IoT – Components of IoT- IoT Architecture and Levels

Unit V **(18 HOURS)**

IoT Ecosystem-Types of Networks – IoT Technologies and Protocols – Communication Protocols – Building Blocks of IoT – Functional Blocks of IoT

Text Books:

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1.	V.K.Jain	Big Data and Hadoop (for Unit I– III)	Khanna Book Publishing	2017
2.	Satish Jain, Shashi Singh	Internet of Things and its Applications : Made simple (for Unit IV – V)	BPB Publication	2020

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.	ArshdeepBahga, Vijay Madisetti	Internet of Things A Hands-on Approach	University press	2014
4.	Peter Waher	Learning Internet of Things	Packt publishers	2015

Web References

1.https://www.google.co.in/books/edition/_/i6NODQAAQBAJ?hl=en&gbpv=1
2.https://hadoop.apache.org/
3. https://www.tutorialspoint.com/cassandra/index.html

4. https://www.rfwireless-world.com/IoT/IoT-Architecture-Levels.html

5. https://iotbyhvm.ooo/physical-design-of-iot

Pedagogy:
Chalk and talk, PPT, Discussion, e-Contents

Course Designers:
Ms.N.Girubagari and Dr.K.Reka

Semester VI	Internal Marks : 25			External Marks:75		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS6MBE2C	**ARTIFICIAL INTELLIGENCE**	**MBE**	**90**	**6**	**-**	**5**

Objective:

- To understand the need of Artificial Intelligence
- 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 Outcomes:

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the AI problems	K2
CO2	Describe various AI techniques	K2
CO3	Apply basic AI algorithms for real time situations	K3
CO4	Explore the concepts of Knowledge Representations	K4

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	S	S
CO3	S	S	S	M
CO4	S	S	S	M

S – Strong; M – Medium; L - Low

Syllabus:

Unit I **(16 HOURS)**

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.

Unit II **(20 HOURS)**

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.

Unit III **(20 HOURS)**

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.

Unit IV **(16 HOURS)**

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.

Unit V **(18 HOURS)**

Machine Learning : Introduction – Data Analysis and Machine Learning- Fundamental approaches- Supervised Machine Learning – Reinforcement Machine Learning – Unsupervised Machine Learning – Semi-supervised Learning – Data modeling- Artificial Neural Network- **Applications of AI :** AI in ecommerce – AI in E-Tourism – AI in industry – AI in medicine

Case Study : Introduction to Artificial Neural Network and Deep Learning.

Text Books:

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1.	Elaine Rich, Kevin Knight, Shivashankar B Nair	Artificial Intelligence (for Unit I – IV)	Tata McGraw Hill, 3rd edition	2017
2	Rajendra Akerkar	Introduction to Artificial Intelligence (forUnit V)	PHI Learning Pvt Ltd, 2nd edition	2014

Reference Books:

S.No	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1.	Eugene Charniak , Drew. McDermott	Introduction to Artificial Intelligence	Pearson Education	2006
2.	Stuart Russel, Peter Norvig	Artificial Intelligence : A Modern Approach	Pearson Education, 3rd edition	2010
3.	Dan W.Patterson	Introduction to Artificial Intelligence and Expert Systems	Pearson Education	2008
4.	Bernard Marr	Artificial Intelligence in Practice: How 50 Successful Companies Used AI and Machine Learning to Solve Problems	Wiley Publications	2019

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

Pedagogy:

Chalk and talk, PPT, Discussion, ICT

Course Designer:

Ms.N.Girubagari

Semester: VI	Internal Marks: 40			External Marks: 60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS6MBE3AP	**OPERATING SYSTEMS LAB**	**MBE**	**75**	**-**	**5**	**5**

Objective:

- To familiarize the students with Linux commands and shell programming
- To demonstrate the concepts of process scheduling,memory management, file systems and deadlock handling using C language in Linux environment

Course Outcomes:

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic command with examples and shell programming	K2
CO2	Implement memory management schemes , page replacement schemes and file allocation	K3
CO3	Analyze the performance of process scheduling algorithms and seek strategies	K4
CO4	Simulate Bankers algorithm for deadlock avoidance	K5

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	S	M
CO3	S	S	S	S
CO4	M	S	S	M

S–Strong; M–Medium; L –Low

Lab Exercises:

1. Basic Commands with Examples
2. Shell Programming
    a) Simple Shell program
    b) Conditional Statements
    c) Testing and Loops
3. Memory Management Techniques
    a) Memory allocation Techniques (First-fit,Best-fit,Worst-fit)
    b) Page Replacement Algorithms (FIFO,LRU)
4. Process Scheduling Algorithms
    a) FCFS
    b) SJF

c) Round Robin

d) Priority Scheduling

5. Simulate Bankers algorithm for the purpose of deadlock avoidance
6. Device Handler Seek Strategies
    a) FCFS
    b) SSTF
    c) SCAN
7. File Allocation Strategies
    a) Sequential
    b) Indexed

Web References:

1. https://ubuntu.com/tutorials/command-line-for-beginners#3-opening-a-terminal
2. https://educatech.in/execution-of-various-file-directory-handling-unix-linux-commands/
3. https://sites.google.com/site/uopops/pm
4. https://apgcm.edu.in/images/nirf%20mca/os-lab

Pedagogy:

Demonstration and Practical sessions

Course Designer:

Dr.K.Reka

Semester VI	Internal Marks: 40			External Marks: 60		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS6MBE3BP	**R PROGRAMMING LAB**	**MBE**	**75**	**-**	**5**	**5**

Objective:

- To provide a basic knowledge to install and use R for simple programming tasks
- To familiarize with R libraries and packages
- To develop R Programs using Looping Constructs and R mathematical functions that can be used for data exploration

Course Outcome:

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

CO Number	CO Statement	Knowledge Level
CO1	Demonstrates data manipulation operations	K2
CO2	Develop programs using Loop constructs	K3
CO3	Use R for Descriptive statistics	K3
CO4	Apply the knowledge of R in data Analytics for real life applications	K3
CO5	Predict unknown values from known dataset	K6

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4
CO1	**S**	**S**	**S**	**S**
CO2	**S**	**S**	**M**	**M**
CO3	**M**	**M**	**S**	**S**
CO4	**S**	**S**	**S**	**S**
CO5	**S**	**S**	**S**	**S**

S- Strong; M- Medium; L-Low

Lab Exercises:

1. Reading data from CSV & Excel files.
2. Perform Vector Manipulation (add, subtract, multiply, divide, sort)
3. Program to get the Fibonacci Series using Function
4. Create a simple arithmetic calculator using decision making statements.
5. Program to convert a List to Vector.
6. Create two matrices and add, subtract, multiply and divide the matrices.
7. Create a Data frame which contain details of 5 employees and display the details.
8. Perform Left, Right and Full Outer join from given two data frames.
9. Plot the histogram, bar chart and pie chart on sample data.
10. Program for creating 3D plots.
11. Perform the linear Regression to predict the weight of a person when his height is known.
12. Create a scatterplot graph for the relational data set.

Web Reference

1. https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf
2. https://www.guru99.com/r-tutorial.html
3. https://www.tutorialspoint.com/r/r_lists.htm
4. https://www.w3resource.com/r-programming

Pedagogy

Power Point Presentation, e-Content

Course Designer

Ms. R.Ramya

Semester VI	Internal Marks : 40			External Marks:60		
COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDITS
19UCS6MBE3CP	WEB TECHNOLOGY LAB	MBE	75	-	5	5

Objective:

- To design interactive web pages using Scripting languages
- To learn server side programming using servlets and JSP

Course Outcomes:

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the basic tags used in HTML document	K1
CO2	Able to write HTML, CSS codes.	K3
CO3	Demonstrate JavaScript and related technologies	K3
CO4	Create dynamic web pages using JSP	K6

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	S	S	S
CO3	S	S	S	S
CO4	M	S	S	S

S–Strong; M–Medium; L –Low

Lab Exercises:

1. Write a HTML code to display the biodata on a web page.
2. Develop static web pages of an online book store using HTML.
3. Design a Style Sheet using Link, Table, Box & List
4. Write a Java script program to converting uppercase to lowercase.
5. Write a Java script to validate the following fields in a registration page.
   a. Name(should contain alphabet and the length should not be exceed 8 characters)
   b. Password(should not be less than 6 characters. It contains atleast 1 upper case letter, numeric, and special character)
   c. Email (Should not contain invalid address)
6. Write a PHP program to store current date-time in a COOKIE and display the "Last visited on" date-time on the web page upon reopening of the same page.
7. Write a PHP program to calculate electricity bill.
8. Write a simple JSP program to print the current date and time
9. Create a web application using JSP with following specifications
   a) It should take name and age from an HTML page.

b) If the age is less than 18, it should send a page with “Hello<name>, you are not eligible to vote” message, where <name>should be replaced with the entered name. Otherwise it should send “welcome, you are eligible to vote” message.

Web References:

1. https://www.halvorsen.blog/documents/programming/web/web.php
2. https://websitesetup.org/website-coding-html-css/
3. https://www.geeksforgeeks.org/web-technology/
4. https://www.csestack.org/html-program-examples-output/
5. https://www.javatpoint.com/php-programs
6. https://www.programiz.com/javascript/examples
7. https://personal.ntu.edu.sg/ehchua/programming/java/JSPByExample.html

Pedagogy:

Power Point Presentations, E-Content

Course Designer:

Ms.R.Sangeetha

Semester VI	Internal Marks: -			External Marks: 100		
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**L**	**T**	**P**	**CREDITS**
19UCS6PW	**PROJECT WORK**	**PROJECT**	**90**	**-**	**6**	**4**

Objective:

- To build problem solving ability and technical skills through the application of theoretical concepts for modeling the real world problems using latest technologies

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Apply the knowledge gained through various courses in solving a real life problem	K3
CO2	Demonstrate the different phases of software/system development life cycle	K2
CO3	Use time and resource management	K3
CO4	Develop programs accustomed to professional environment and/or style typical of a global IT industry	K3
CO5	Analyze different testing strategies for project evaluation	K4

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4
CO1	**S**	**S**	**S**	**S**
CO2	**S**	**S**	**S**	**S**
CO3	**S**	**S**	**S**	**S**
CO4	**S**	**S**	**S**	**S**
CO5	**S**	**S**	**S**	**S**

S- Strong; M- Medium; L-Low

Project Evaluation

The project work shall be done by either an individual or a group of students. Two components will be considered in assessing the project work:

- Dissertation
- Viva Voce

The Dissertation/Project work submitted willbe evaluated based on the followingcomponents:

- Problem Identification
- Domain Knowledge
- Documentation
- Presentation