CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS) Nationally Accredited (III Cycle) with A Grade by NAAC ISO 9001:2015 Certified Annamalai Nagar, Trichy

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE



B.Sc Computer Science with Cognitive Systems

2021-2022 onwards

B.Sc Computer Science with Cognitive Systems PROGRAMME OUTCOMES

- To gain knowledge in the core topics of Computer Science and to develop an equalappreciation of current industry standards
- To equip industry ready students and teaching ecosystem that provide values to businessneeds in the area of IT Infrastructure and IT Application, Maintenance & Service Support
- Learn to comprehend and integrate learners research practice in computational languages, Artificial Intelligence, Machine Learning, Robotics and Human Computer Integration
- To create awareness on current issues and latest trends in technological development andthereby implement innovative ideas and solutions to existing problems in society



Cauvery College for Women (Autonomous) PG & Research Department of Computer Science B.Sc Computer Science with Cognitive Systems

(For the Candidates admitted from the Academic year **2021-2022** and onwards)

r		_ Course Title			Inst.		Exam			Total
este	t		Title	Course Code Hrs/		s	Hrs	rs Marks		
eme	Par				Wee	dit				
S	Γ				K	Cre		Int.	Ext.	
		Language Course- I (LC)	Ikkaala Ilakkiyam	19ULT1						
			Story, Novel, Hindi Literature-I & Grammar-I	19ULH1						
	Ι	Tamil*/Other Languages**#	Communication in French-I	19ULF1	6	3	3	25	75	100
			History of Popular Tales Literature and Sanskrit Story	19ULS1						
Ι	II	English Language Course- I (ELC)	Functional Grammar for Effective Communication-I	19UE1	6	3	3	25	75	100
		Core Course – I(CC)	Operating System (Theory & Practicals)	21UCG1CC1	4+2	5	2	50*	50*	100
	III	Core Practical - I (CP)	Introduction to Worksheets	21UCG1CC1P	2	2	3	40	60	100
		Core Course – II (CC)	IT Cognition and Problem Solving	21UCG1CC2	4	3	3	25	75	100
		First Allied Course- I	Essential Mathematics	21UCG1AC1	4	3	3	25	75	100
	IV	UGC Jeevan Kaushal Life Skills	Universal Human Values	20UGVE	2	2	3	25	75	100
	TOT	AL	-		30	21				700
			Idaikkaala Ilakkiaymum Puthinamum	19ULT2						
		Language Prose, Drama, Hindi Literature- Course- II(LC) 2 Grammar-II 19ULH2 Tamil Communication in 19ULF2 / Other Languages **# Poetry Textual Grammar and Alankara	Prose, Drama, Hindi Literature- 2 Grammar-II	19ULH2				25	75	
	Ι		Communication in French-II	19ULF2	6	3	3			100
			-							
II	II	English Language Course- II(ELC)	Functional Grammar for Effective Communication-II	19UE2	6	3	3	25	75	100
		Core Course – III (CC)	Computer Networks (Theory & Practicals)	21UCG2CC3	4+2	5	2	50*	50*	100
	III	Core Course - IV(CC)	Information Technology Infrastructure Library -ITIL	21UCG2CC4	2	2	3	25	75	100
		First Allied Course- II	Statistics	21UCG2AC2	4	3	3	25	75	100
		First Allied Course-	Operations Research	21UCG2AC3	4	3	3	25	75	100
	IV	Environmental Studies	Environmental Studies	21UGES	2	2	3	25	75	100
	TOTAL				30	21				700

		Languaga	Kaapiyamum Naadagamum	19ULT3						
	Ι	Course-III (LC)-Tamil*/ Other	Medieval,Modern Poetry & History of Hindi Literature-3	19ULH3	6	2	2	25	75	100
		Languages** #	Communication in French-III	19ULF3	0	3	3	25	15	100
			Prose, Textual Grammar and Vakyarachana	19ULS3						
III	II	English Language Course-III (ELC)	Reading and Writing for Effective Communication-I	19UE3	6	3	3	25	75	100
		Core Course – V (CC)	Java Programming (Theory & Practicals)	21UCG3CC5	4+2	5	2	50*	50*	100
	III	Core Course– VI (CC)	Infrastructure Management	21UCG3CC6	6	5	3	25	75	100
		Second Allied Course– I	Digital Computer Fundamentals	21UCG3AC4	4	3	3	25	75	100
		Non Major Elective	Office Automation Lab	21UCG3NME1P				40	60	
	IV	Ι	Basic Tamil	19ULC3BT1	2	2	3	25	75	100
			Special Tamil	19ULC3ST1	_	-	U	23	15	100
				TOTAL	30	21				600
			Pandaiya Ilakkiyam	19ULT4						
	Ι	Language Course - IV (LC) - Tamil */	Letter writing, General Essays, Technical Terms, Proverbs, Idioms & Phrases, Hindi Literature-4	19ULH4	6 3	3	3 3	25	75	100
		Other	Communication in French- IV	19ULF4				23		
		Language**#	Drama, History of Drama Literature	19ULS4						
	Π	English Language Course- IV(ELC)	Reading and Writing for Effective Communication-II	19UE4	6	3	3	25	75	100
IV	III	Core Course – VII(CC)	Database Management Systems (Theory & Practicals)	21UCG4CC7	4+2	5	2	50*	50*	100
		Second Allied Course– II	Digital & Microprocessor Practicals	21UCG4AC1P	3	3	3	40	60	100
		Second Allied Course– III	Microprocessor & Microcontrollers	21UCG4AC5	3	3	3	25	75	100
		Non Major	Multimedia Practical	21UCG4NME2P			_	40	60	100
		Elective II	Basic Tamil	19ULC4BT2	2	2	3	25	75	100
			Special Tamil	19ULC4ST2						
	IV	Skill Based Elective – I	HTML,CSS, JavaScript Practical	21UCG4SBE1AP	2	2	3	40	60	100
			Computer Hardware and Trouble Shooting Practical	21UCG4SBE1BP						
		Behavioral	Campus to Corporate	21UGCM	2	1	-	100	-	100
		Course								
		TOTAL		<u> </u>	30	22				800
1					20		1		1	

VI					180	140				4200
VI	ΤŌ	OTAL			30	28				700
VI		Extension activity		19UGEA	0	1	0	-	-	0
VI	v	Gender Studies	Gender Studies	19UGGS	1	1	3	25	75	100
VI	IV	- III	MONGODB Practical	21UCG6SBE3BP	1					
VI		Skill Based Elective	Mobile Application Development Practical	21UCG6SBE3AP	2	2	3	40	60	100
VI		Project	Project Work	21UCG6PW	5	4	-	-	100	100
			Big Data & IoT	21UCG6MBE3C						100
		Elective – III	Interaction		5	5	3	25	75	100
	III	Major Based	Human Computer	21UCG6MBE3B	1					
			Network Security	21UCG6MBF3A	5	5	5	25	15	100
		Elective – II	Mobile Computing Data mining & Warehousing	21UCG6MBE2C	5	5	3	25	75	100
		Major Based	M 1 1 C	21UCG6MBE2B	-					
		XIII (CC)	Algorithms Artificial Intelligence	21UCG6MBE2A		5				
		Core Course –	Data structures &	21UCG6CC13	6	5	3	25	75	100
		Core Course – XII (CC)	Python Programming (Theory & Practicals)	21UCG6CC12	4+2	5	2	50*	50*	100
	TOTAL				30	27				700
		UGC Jeevan Kaushal Life Skills	Professional Skills	21UGPS	2	1	3	25	75	100
		-II	Dot Net Practical	21UCG5SBE2BP						
	IV	Skill based Elective	Virtualization & Cloud Practical	21UCG5SBE2AP	2	2	3	40	60	100
			Computer Graphics	21UCG5MBE1C						
			Process Management	21UCG5MBE1B	5	5	3	25	75	100
		Major based Elective – I	Computer Organization & Architecture	21UCG5MBE1A						
v		Core Course - XI(CC)	Virtualization & Cloud	21UCG5CC11	4	4	3	25	75	100
	III	Core Course – X (CC)	Client Relationship Management (Theory & Practicals)	21UCG5CC10	4+2	5	2	50*	50*	100
		Core Course- IX (CC)	Introduction to Digital Technologies (Theory & Practicals)	21UCG5CC9	4+2	5	2	50*	50*	100
		Core Course – VIII (CC)	Software Testing (Theory & Practicals)	21UCG5CC8	3+2	5	2	50*	50*	100

Theory & Practicals: ESE: 50 (Theory Exam), CIA: 50* (Practicals:40 + Theory :10)

For Theory Courses:

- The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 75marks (i.e.30 marks)

For Practical Courses:

- The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e. 24 marks)

For Theory & Practicals Courses:

- The passing minimum for CIA shall be 40% out of 50 marks (i.e. 20 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 50 marks (i.e.20 marks)

For Project Work:

The passing minimum not less than 40% out of 100 marks

	Course	No. of Courses	Credits	Total Credits
Ι	Tamil/ Other Language	4	12	12
II	English	4	12	12
	Core (Theory& Practicals)	14	61	
	Project Work	1	4	
III	First Allied	3	9	98
	Second Allied	3	9	
	MBE	3	15	
	NME	2	4	
	SBE	3	6	
IV	Universal Human Values	1	2	16
	Environmental Studies	1	2	
	Professional Skills	1	1	
	Behavioural Oriented Course	1	1	
V	Gender Studies	1	1	02
	Extension Activities	-	1	
	Total	42		140

Courses & Credits for C.Sc with Cognitive Systems (2021-2022)

SEMESTER I

Semester I	Internal Marks: 50			-	Exter	nal Marks:50
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG1CC1	OPERATING SYSTEM (THEORY&PRACTICALS)	CORE	90	4	2	5

Objective

- To recognize the concepts and principles of Windows operating system.
- To inculcate knowledge on Backup and recovery
- To learn how to install, configure, deploy, manage and maintain the operating system

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Ability to work in Windows 10 operating system, its tools and utilities.	K1
CO2	Understand the roles and features of windows server	K2
CO3	Analyze the basics of server management	К3
CO4	Monitor Windows servers	K3
CO5	Perform server backup and restoration	K4

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	М
CO2	S	S	М	М
CO3	S	S	S	S
CO4	М	М	М	М
CO5	S	S	М	М

S–Strong; M–Medium; L –Low

Syllabus

Theory:

UNIT – I

Operating System overview and Windows: Introduction to Windows, Versions of Windows, GUI Components, Windows Features, Windows 10 Installation, User Management, Disk

(12 Hours)

Management, Security, IP Configuration, File Permissions and Sharing, Backup & Recovery, Devices and Printers

UNIT –II

Server Operating System: Introduction to Windows Server, Version of Windows Servers, Windows Roles and Features, Installation of Server OS, Installation of Roles and Features

UNIT –III

Managing Windows Servers: Account Management, Group Management, Server Access Management, Network Configuration and Storage Management

UNIT –IV

Monitoring Windows Servers: Task Manager, Performance Management, Event Log Management, Alerts and Reports

UNIT –V

Backup and Recovery of Windows Servers: Overview of Backup, Types of Backup, Server Backup & Restoration, Basic Server Troubleshooting

Practical: List of Exercises

- 1. Windows 10 OS
 - a. Windows 10 Installation
 - b. Creating Users
 - c. Configuring Disks
 - d. Exploring File Permissions
 - e. Backup & Recovery of Windows 10
- 2. Windows Server OS
 - a. Installation of Windows Server OS
 - b. Installation of different Roles and Features

3. Managing Windows Servers

- a. Create Users and Groups
- b. Explore Roles and Access
- c. Explore Network Configuration
- d. Explore Storage Management
- 4. Monitor Windows Servers
 - a. Exploring Task Manager
 - b. Exploring Performance Monitor
 - c. Exploring Event Log
 - d. Exploring Alerts and Reports
- 5. Backup & Recovering Windows Servers
 - a. Backup Windows Server
 - b. Restore Windows Server Backup

(12 Hours)

(12 Hours)

(12 Hours)

(12 Hours)

Suggested Readings

TCS Material

Web References

Theory:

- 1. https://www.tutorialspoint.com/windows10/windows10_overview.htm
- 2. <u>https://docs.microsoft.com/en-us/windows-server/administration/server-manager/install-or-uninstall-roles-role-services-or-features</u>
- 3. <u>https://docs.microsoft.com/en-us/windows-server/storage/disk-management/overview-of-disk-management</u>
- 4. <u>https://docs.microsoft.com/en-us/windows-server/troubleshoot/windows-server-troubleshooting</u>

Practical:

- 5. <u>https://www.youtube.com/watch?v=CraR01ya9ds</u>
- 6. https://it.hessercan.com/wp-content/uploads/2017/09/laboratory 01-2017.pdf
- 7. <u>https://docs.microsoft.com/en-us/windows/deployment/windows-10-poc</u>

Pedagogy

Chalk and talk, PPT, Demonstration, e-content

Course Designer

TCS

Semester I	Inte	ernal Marks: 40		E	xtern	al Marks:60
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG1CC1P	INTRODUCTION TO WORKSHEETS	CORE	30	-	2	2

Objective

- To perform basic calculations and formatting
- To inculcate the knowledge of Macros
- To create applications using VBA code

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate the use of basic functions, LOOKUPS and formatting	K2
CO2	Build Applications using VBA code	K3
CO3	Ability to write Macros and implement data visualization	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	М	S
CO2	S	М	S	S
CO3	S	М	S	S

S-Strong; M-Medium; L-Low

List of Exercises

EXCEL

- 1. Excel worksheet for Formatting, Math function and Text function
- 2. Excel worksheet for Graph Function
- 3. Excel worksheet for VLOOKUP, HLOOKUP and other LOOKUPS
- 4. Excel worksheet for Pivot

VBA

- 5. Unhide all worksheets at one Go
- 6. Hide All Worksheets except the Active Sheet
- 7. Protect and Unprotect All worksheets in a Workbook
- 8. Save each Worksheets as a separate PDF
- 9. Change the Letter Case of Selected Cells to Upper Case
- 10. Sort Data by Single and Multiple Columns
- 11. Highlight Blank Cells with VBA

Software Essentials: Microsoft office 2007

Web References

- 1. https://www.excel-exercise.com/beginner/
- 2. <u>https://trumpexcel.com/excel-macro-examples/</u>

Pedagogy

Power Point Presentation, Demonstration

Course Designer TCS

Semester I	Inte	Internal Marks: 25		E	xtern	al Marks:75
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG1CC2	IT COGNITION & PROBLEM SOLVING	CORE	60	4	-	3

Objective

- To enable the learners to understand the concepts of cognitive process
- To empower the learners with the skills required for virtual collaboration and cultural sensitivity

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Outline Cognitive Process	K1
CO2	Reproduce perceptual process	K1
CO3	Identify factors affecting memory	K2
CO4	Solve different types of problems	К3
CO5	Experiment different skills	K4

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	L	М	L	М
CO2	L	М	L	М
CO3	L	М	L	М
CO4	L	М	L	М
CO5	L	М	L	М

S-Strong; M-Medium; L-Low

Syllabus

Unit I

Introduction to Cognition: Meaning, cognitive processes, Development of cognitive psychology

Unit II

Perceptual Processes; Attention: Divided attention, Selective Attention, Visual attention and Auditory attention. Consciousness: Varieties, Subliminal Perception. Visual Perception Perceptual Organizational Processes, Multisensory interaction and Integration: Synthesis, Comparing the senses, Perception and Action.

(15 Hours)

(7 Hours)

Unit III

Memory- Working Memory: Factors affecting the capacity of working Memory.Long Term Memory: Encoding and Retrieval in Long Term Memory, Autobiographical Memory. Memory Strategies: Practice, Mnemonics using Imagery, Mnemonics using organization. Meta cognition :Meta memory, TOT, Meta comprehension.

Unit IV

Problem Solving, Reasoning and Decision Making: VUCA World Problem Solving, Types of problems, Factors that influence Problem Solving, creativity, Reasoning : Inductive and Deductive Reasoning. Decision Making : Heuristics in decision making , representativeness, availability and Anchoring and adjustment. The framing effect, Overconfidence in decisions, The Hindsight Bias.

Unit V

(8 Hours)

Future Skills: Critical thinking, Adaptive thinking, Cognitive Load Management, Design thinking, Virtual Collaboration and Cultural Sensitivity

Suggested Readings

- 1. Matlin M.W. (2003) 'Cognition' 5th Edition, Wiley Publication.
- Riegler, B.R., Reigler, G.L. (2008), Cognitive Psychology Applying the Science of Mind. 2nd Edition, Pearson Education.
- 3. Benjafield J G (2007). 'Cognition' 3rd Edition. Oxford University Press.
- 4. Goldstein B.E.(2008) 'Cognitive Psychology' 2nd Edition, Wadsworth

Web References

- 1. <u>https://sjsu.edu/people/mark.vanselst/courses/p135/s1/Kellogg_c1_fall2013.pdf</u>
- 2. https://jvapartners.com/problem-solving-and-decision-making-in-a-vuca-environment/
- 3. <u>https://plato.stanford.edu/entries/critical-thinking/</u>

Pedagogy Chalk & Talk, PPT

Course Designer

TCS

(15 Hours)

(15 Hours)

ALLIED COURSE -- I (AC)

Semester I	Internal Marks: 25			Ex	tern	al Marks: 75
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG1AC1	ESSENTIAL MATHEMATICS	ALLIED	60	4	-	3

Objective

- To inculcate the basics of Differentiation, Integration and their applications.
- To acquire the knowledge of solving problems using ordinary and partial differential equations.
- To understand the fundamental concepts in graph theory.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
C01	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.	К3
CO4	Apply Differentiation to find the solutions of Ordinary and Partial Differentiation.	К3
CO5	Classify the various types of integrals.	К3
CO6	Solve different types of ordinary differential equation.	К3
CO7	Classify the characteristics of graph theory.	К3

Mapping with Programme Outcomes

COs/POs	PO1	PO2	PO3	PO4
CO1	S	S	S	М
CO2	S	S	М	М
CO3	S	S	S	S
CO4	М	М	М	М
CO5	S	S	М	М
CO6	S	М	М	М
CO7	S	S	S	S

S–Strong;M–Medium; L-Low

(12 HOURS)

Matrices – Special types of Matrices– Scalar Multiplication of a Matrix – Equality of Matrices – Addition of Matrices – Subtraction – Symmetric Matrix – Skew symmetric Matrix – Hermitian and Skew Hermitian Matrices Multiplication of Matrices – Inverse Matrix– Relation between adjoint and Inverse Matrices –Solution of Simultaneous equations –Rank of a Matrix– A system of *m* homogeneous linear equations in *n* unknowns – System of non-homogeneous linear equations – Linear Dependence and Independence of Vectors – Eigenvalues and Eigenvectors – Similar Matrices –Cayley-Hamilton's Theorem (proof not needed) –Simple applications only.

UNIT II

Differentiation

Maxima & Minima – Concavity and Convexity, Points of inflexion-Partial differentiation Functions of function rule – Total Differential Coefficient – A Special case – Implicit Functions – Homogeneous functions –Euler's Theorem(proof not needed)–Simple problems only.

UNIT III

Integration

Integration of Rational algebraic functions– Rule (a)– Rule (b) : Type i: $\int \frac{dx}{ax^2+bx+c}$,

Type ii: $\int \frac{(lx+m)}{ax^2+bx+c}$ – Integration of Irrational functions : Case (ii) Integration of the form

 $\int \frac{px+q}{\sqrt{ax^2+bx+c}} - \text{Type} \int \frac{dx}{a+b\cos x} - \text{Properties of definite integrals} - \text{Integration by parts.}$

UNIT IV

(12HOURS)

Differential Equations

Type A : Variables Separables – Type D : Linear equation.

Linear Differential Equation with constant co-efficients – Particular Integral – Special methods of finding P.I. : X be of the form (a) $e^{\alpha x}$ (b) $\cos \alpha x$ or $\sin \alpha x$, where α is a constant (c) x^m (a power of x), m being a positive integer (d) $e^{kx} f(x)$

UNIT V

Graph Theory

What is a Graph?– Application of Graphs – Finite and infinite graphs – Incidence and Degree – Isolated Vertex, Pendant Vertex, and Null Graph –Isomorphism–Sub graphs– A Puzzle With Multicolored Cubes – Walks, Paths, and Circuits –Connected Graphs, Disconnected Graphs, and Components – Euler graphs.

Syllabus

UNIT I

Matrices

(12 HOURS)

(12 HOURS)

(12HOURS)

S.No	AUTHORS	TITLE	PUBLISHERS	YEAR OF
				PUBLICATION
1	T.K. Manicavachagom	Algebra,	S. Viswanathan (Printers &	Reprint 2015
	Pillay, T.Natarajan,	Volume II	Publishers) Pvt.,Ltd.	
	K.S.Ganapathy			
2	S. Narayanan,	Calculus,	S. Viswanathan (Printers &	Reprint 2015
	T.K.Manicavachagom Pillay	Volume I	Publishers) Pvt., Ltd.	
3	S. Narayanan,	Calculus,	S. Viswanathan (Printers &	2004
	T.K.Manicavachagom Pillay	Volume II	Publishers) Pvt., Ltd.	
4	S. Narayanan,	Calculus,	S. Viswanathan (Printers &	Reprint 2015
	T.K.Manicavachagom Pillay	Volume III	Publishers) Pvt., Ltd.	
5	Narsingh Deo	Graph Theory	Prentice Hall of India	June 2003
			Private Limited	

Chapters and Sections

UNIT	TEXT BOOK	CHAPTER	SECTION
Ι	1	2	1 to 8, 10 to 16
II	2	5 8	1.1 to 1.5 & 2 1.1 to 1.6
III	3	1	7.1 to 7.3 8 (CASE II), 9, 11, 12
IV	4	1 2	2.1 and 2.4 1 to 4
V	5	1 2	1.1 to 1.5 2.1 to 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	2014
			Publications, Chennai	
3	S.Arumugam and	Invitation to	SciTech Publications	2006
	S.Ramachandran	GraphTheory	(India) PvtLtd., Chennai	

Pedagogy

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

Youtube Links

- 1. <u>https://youtu.be/rowWM-MijXU</u>
- 2. https://youtu.be/Gxr3AT4NY_O
- 3. <u>https://voutu.be/xlbbefbYLzg</u>
- 4. https://youtu.be/s5KZw1

Course Designers

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

SEMESTER II

Semester II	Internal Marks:50			External Marks:5		
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG2CC3	COMPUTER NETWORKS (THEORY&PRACTICALS)	CORE	60+30=90	4	2	5

Objective:

- To inculcate knowledge on the concept of OSI Reference Model and the TCP/IP Reference Model
- To understand the Data link Layer protocols and Routing Algorithms
- To enable the learners to understand the Cisco Products

Course Outcome:

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

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Identify the components of Computer Networks	K1
CO2	Explain the functions of layers in OSI Reference Model and TCP/IP Reference Model	K2
CO3	State the routing principles	K1
CO4	Execute Switch basic commands	K3
CO5	Perform routing in Cisco Packet Tracer Software	К3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	М
CO2	S	S	S	S
CO3	S	S	S	S
CO4	S	М	М	М
CO5	S	S	М	М

Theory:

UNIT-I

(12 Hours)

Introduction To Computer Networks: Introduction: Definition of a Computer Network; Components of a Computer Network: Use of Computer networks; Networks for companies, Networks for people, Social Issues: Classification of networks based on transmission technology, Based on the scale, Local area networks, Metropolitan area networks, Wide area networks, Wireless networks-Data transmission modes; Serial & Parallel, Simplex, Half duplex & full duplex, Synchronous &Asynchronous Transmission.

UNIT-II

Network Software & Network Standardization: Introduction: Networks Software: Protocol hierarchy, Design issues for the layers, Merits and De- merits of Layered Architecture, Service Primitives: Reference models; The OSI Reference Model, The TCP/IP Reference Model, Comparison of the OSI & the TCP/IP Reference Models. Network Topologies; Linear Bus Topology, Ring Topology, Star Topology, Hierarchical or Tree Topology-Guided Transmission Media.

UNIT-III

Data Link Layer: Introduction: Goal of DLL: Design issues of DLL; Servicesprovided to the Network layer, Framing, Error control, Flow control, Link Management, ARQ strategies: Error Detection and correction; Parity bits, Single bit error correction. Error Detection or Cyclic Redundant Code (CRC): Data Link layer protocols: Transmission control protocols, HDLC.

UNIT-IV

Principles of Routing: Types of Routing Algorithms, Classes of Routing Algorithms, Properties of Routing Algorithms, Optimality Principle. Routing algorithms; Shortest Path Algorithm, Flooding, Distance Vector Routing, Hierarchical Routing, Link State Routing- Congestion Control Algorithms.

UNIT-V

Introducing Cisco Products- Cisco software- Cisco hardware- Routing with Cisco Routers: Routing Information Protocol (RIP)- Enhanced Interior Gateway Routing Protocol (EIGRP)-The Foundation of EIGRP- EIGRP Benefits- Characteristics of EIGRP- EIGRP Operation- Introducing Open Shortest Path First- OSPF Routing Hierarchy.

Suggested Readings

- 1. Behrouz A Forouzan Data Communications and Networking Tata McGraw Hill 5th Edition, 2017
- 2. David J.Wetherall, Andrew S.Tanenbaum, "Computer Networks", 5th Edition, Pearson Education, 2019
- 3. SilviuAngelescu CCNA Certification Allin-One For Dummies For Dummies 2010

Web References

- 1. https://www.studytonight.com/computer-networks/overview-of-computer-networks
- $2. https://www.tutorialspoint.com/data_communication_computer_network/index.html$
- 3. https://www.geeksforgeeks.org/transport-layer-responsibilities/?ref=lbp

(12 Hours)

(12 Hours)

(12 Hours)

(12 Hours)

Practicals: List of Exercises

- 1. Switch basic VLAN
- 2. Routing Static
- 3. Switch basic commands
- 4. Switch basic STP
- 5. Dynamic Routing protocols OSPF, RIP, EIGRP

Software Essentials: Cisco packet tracer software (Freeware)

Web References

- 1. https://booksite.elsevier.com/9780123850591/Lab_Manual/Lab_04.pdf
- 2. https://www.networkcomputing.com/data-centers/comparing-dynamic-routing-protocols

Pedagogy

Chalk and talk, PPT, Demonstration, e-content

Course Designer

TCS

Semester II	Internal Mark	s: 25			Exter Marks	rnal s: 75
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG2CC4	INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY-ITIL	CORE	30	2	-	2

Objective:

- To be able to design knowledge based system.
- To know the Key Principles Models and Concepts of service management
- To understand the process management, risk management and event management concepts.
- To know the Challenges in providing IT Infrastructure Services

Course Outcomes:

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

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Describe service lifecycle model	K1
CO2	Classify the key principles models and concepts of service management	K2
CO3	Express the process management and risk management	K2
CO4	Identify the challenges in providing IT infrastructure services	K3
CO5	Illustrate the event management concepts.	К3

Mapping with Programme Outcomes:

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

S-Strong; M-Medium; L-Low

Syllabus:

UNIT - I

Introduction to ITIL -Service Life Cycle Model-Components and Phases of a Service Life Cycle-Main concept of Service Life Cycle-Service Management as a Practice.

UNIT -II

Introduction to Service- Service Management-What comprises Value? - The 4 Ps of Service Design-Key IT Service Management Roles-Key Principles Models and Concepts.

UNIT – III

Process - Functions - Specific Roles - RACI - Risk Management - Business Case Life Cycle Phases - Service Strategy - Service Design - Service Transition - Service Operation - CSI.

UNIT-IV

Automation - Evolution of IT Infrastructure Services - Challenges in providing IT Infrastructure Services - The future state of IT Infrastructure Services - Automation and Analytics.

UNIT - V

SNOC - Event Management - Objectives of Event Management - Scope of Event Management -Value to the Organization - Draw IT Infrastructure facilities for Hospital Management System, E-Governance and Banking Sector.

Suggested Readings:

- 1. Central Computer and Telecommunications Agency (CCTA) (2000), "Service Support (CCTA): (IT Infrastructure Library)", Part 15, Stationery Office Books.
- 2. Nwabueze Ohia(2019), "IT Infrastructure Risk and Vulnerability Library: A Consolidated Register of Operational and Technology Infrastructure Vulnerabilities for IT Assurance Professionals", Japanese Edition.

Web References

- 1. https://searchdatacenter.techtarget.com/definition/ITIL
- 2. https://www.geeksforgeeks.org/information-technology-infrastructure-library-itil/

Pedagogy

Power Point Presentation, Demonstration

Course Designer

TCS

(06 Hours)

(05 Hours)

(07 Hours)

(06 Hours)

(06 Hours)

ALLIED COURSE -- II (AC)

Semester II	Internal Marks: 25			Ext	ernal M	arks:75
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG2AC2	STATISTICS	ALLIED	60	4	-	3

Objectives

- To enable the students to know a short historical development of Statistics
- To provide the knowledge to interpret and solve the statistical problems
- To ensure the students with the ideas of statistical tools

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the concepts of graphical representation of a frequency	K1
	distribution.	
CO2	Describe the concepts of measures of central tendencies and measures of dispersion.	K2
CO3	Classify the various properties of the Correlation and Regression co- efficient and their applications.	К3
CO4	Apply the Chi Square Distribution and discuss the applications of Chi Square Distribution to conduct tests of goodness of fit.	К3
CO5	Explain Students t and F Statistics and derive their probability Distribution.	K2

Mapping with Programme Outcomes

COs/POs	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	М	S
CO3	S	S	S	S
CO4	S	S	S	S
CO5	S	S	S	S

S-Strong, M-Medium, L-Low

(12 Hours)

Introduction (Meaning and Scope):Origin and Development of Statistics - Statistics defined -Importance and Scope of Statistics - Limitations of Statistics - Distrust of Statistics - Role of Computersin Solving Statistics Problems.

Descriptive Measures: Introduction - Frequency Distribution - Graphic Representation of a Frequency Distribution.

Unit II

Measures of Central Tendency : Averages - Arithmetic Mean - Median - Mode - Geometric Mean - Harmonic Mean.

Unit III

Dispersion - Measures of Dispersion - Coefficients of Dispersion (Problems Only).

Unit IV

Correlation : Introduction - Meaning of Correlation - Scatter Diagram - Karl Pearson's Co-efficient of Correlation - Rank Correlation (Problems Only).

Linear Regression: Introduction - Linear Regression - Regression Coefficients - Properties of Regression Coefficients.

Unit V

Applications of Chi-Square Distribution - Goodness of Fit test- Applications of t-distribution - t-test for Single Mean - t-test for difference of Means - Paired t-test for difference of Means - Applications of F-distribution - F-test for Equality of two Population Variances (Problems Only).

Text Book

S.No.	Authors	Title of the Book	Publishers	Year of Publication
1	S.C.Gupta & V.K.Kapoor	Fundamentals of Mathematical Statistics	Sultan Chand & Sons, New Delhi.	2014

Chapters and Sections

UNIT	CHAPTER	SECTION
Т	1	1.1 to 1.6
1	2	2.1 to 2.3
II	2	2.4 to 2.9
III	2	2.12 to 2.14
IV	10	10.1 to 10.4 and 10.7
ĨV	11	11.1 to 11.2 (11.2.1 and 11.2.2) only
V	15	15.6 (15.6.2) only
v	16	16.3(16.3.1 to 16.3.3) and 16.6(16.6.1) only

SYLLABUS

Unit I

(12Hours)

(12 Hours)

(12 Hours)

(12Hours)

Reference Books:

S.No.	Authors	Title of the book	Publishers	Year of publication
1	S.C.Gupta & V.K.Kapoor	Elements of Mathematical Statistics	Sultan Chand & Sons,New Delhi.	2004
2	R.S.N.Pillai & Bhagavathi, Statistics	Theory and Practice	S.Chand & Sons, New Delhi	2008
3	G.S.S.Bhisma Rao	Probability and Statistics	Scitech Publications (India) Private Limited	2011

Weblinks:

- 1. <u>https://www.youtube.com/watch?v=6DYtC7lrVuY</u>
- 2. <u>https://www.youtube.com/watch?v=YGObRCEZiC8</u>
- 3. <u>https://www.youtube.com/watch?v=xZ_z8KWkhXE</u>
- 4. https://www.youtube.com/watch?v=nk2COITm_eo
- 5. https://www.youtube.com/watch?v=2OeDRsxSF9M
- 6. <u>https://www.youtube.com/watch?v=zmyh7nCjmsg</u>

Pedagogy

Power Point Presentation, Group Discussion, Seminar, Assignment.

Course Designers

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

ALLIED COURSE -III (AC)

Semester II	Internal Marks: 25		Exte	ernal Ma	rks:75	
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG2AC3	OPERATIONS RESEARCH	ALLIED	60	4	-	3

Objectives

- 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

СО	CO Statement	Knowledge
Number		Level
CO1	Explain the applications of Operations research.	K2
CO2	Illustrate the formulations of Linear Programming Problem and Solve them by graphical method	К3
CO3	Classify the different types of Simplex methods	K3
CO4	Describe the concepts of Transportation Problem and AssignmentProblem and compute the solution by various methods	К3
CO5	Determine the solution of Sequencing Problem	K4
CO6	Compute PERT and CPM in Network Analysis	K3

Mapping with Programme Outcomes

COs/POs	PO1	PO2	PO3	PO4
CO1	S	S	М	М
CO2	S	S	S	S
CO3	М	S	М	М
CO4	S	S	S	S
CO5	S	S	S	S
CO6	S	S	S	S

S – Strong; M – Medium; L - Low

SYLLABUS

UNIT I

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

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

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_j '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

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

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.

(10 HOURS)

(15 HOURS)

(10 HOURS)

(10 HOURS)

(15 HOURS)

	Text Book			
S.No	Authors	Title	Publishers	Year of Publication
1	Kanti swarup,P.K.Gupta &	Operations	Sultan Chand and Sons	Reprint 2014
	Man Mohan	Research	Publishers, New Delhi,	
			Sixteenth edition	

Chapters and Sections

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

Reference Books:

S.No	Authors	Title	Publishers	Year of Publication
1	Prem Kumar Guptaand D.S. Hira,	An Operations Research	S. Chand and Co., Ltd. NewDelhi	2004
2	Hamdy A. Taha	Operations Research: An Introduction	Phi Learning, NewDelhi	2007

Weblinks:

- 1. https://youtu.be/H53JSXPXPxI
- 2. <u>https://voutu.be/M8POtpPtOZc</u>
- 3. https://youtu.be/-w2z3MVTcOA
- 4. https://youtu.be/qzUODIPEnxI
- 5. https://youtu.be/WrAf6zdteXI
- 6. https://youtu.be/rrfFTdO2Z7I

Pedagogy

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

presentations, Brainstorming,e- content.

Course Designers

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

SEMESTER III

Semester III	Internal Marks: 50				terna	l Marks:50
COURSE CODE	COURSE TITLE CATEGORY L				Р	CREDITS
21UCG3CC5	JAVA PROGRAMMING (Theory & Practicals)	CORE	60+30 =90	4	2	5

Objective

- To provide the basic OOPs concepts in Java
- To comprehend building blocks of OOPs language, inheritance, package and interfaces
- To identify exception handling methods in Java
- To develop GUI based desktop application in project-based learning

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand OOPs concepts and implement in Java	K1
CO2	Demonstrate the concept of object oriented programming through Java	K2
CO3	Apply the concept of inheritance, interfaces ad Exception handling methods to develop java programs	К3
CO4	Develop java programs for applets and graphics programming	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	М
CO2	S	S	М	М
CO3	S	S	S	S
CO4	М	М	М	М

S-Strong; M-Medium; L -Low

Syllabus

Theory

Unit I:

(12 HOURS)

(12 HOURS)

Fundamentals of Object Oriented Programming: Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming –Application of Object-Oriented Programming. Overview of Java: Simple Java program – Structure – Java Tokens – Statements - Java Virtual Machine. -@ Java Evolution: History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers.

Unit II:

Constants, Variables, Data Types - Classes, Objects and Methods. - @ Operators and Expressions - Decision

Making and Branching: if, if...else, nested if, switch, ?: Operator – Decision Making and Looping: while, do, for – Jumps in Loops – Labeled Loops.

Unit III:

Arrays, Strings– Interfaces: Multiple Inheritance – Packages: Putting Classes together – Multithreaded Programming.

Unit IV:

Managing Errors and Exceptions – Applet Programming – Graphics Programming.

Unit V:

Managing Input/Output Files in Java: Concepts of Streams- Stream Classes – Byte Stream Classes – Character Stream Classes – Using Streams – I/O Classes – File Class – I/O Exceptions – Creation of files – Reading / Writing Characters– Random Access Files.

@ - Portions for Self Study

Text Book

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	E. Balagurusamy	Programming with Java	McGraw Hill Education(India) pvt ltd	2019

Reference Books

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
		The Complete	McGraw Hill	
1	Herbert Schildt	Reference	Education(India) pvt	2019
		JAVA-Eleventh Edition	ltd	

Web References

- 1. https://www.slideshare.net/sreedharchowdam1/java-notes-56309340
- 2. https://sites.google.com/a/rcoe.co.in/computer-programming-ii-java/dashboard/java-notes
- 3. https://slideplayer.com/slide/13598881/

Practicals List of Exercises

- 1. Write a Java Program to define a class, describe its constructor, overload the Constructors and instantiate its object.
- 2. Write a Java program to practice using String class and its methods.
- 3. Write a Java Program to implement inheritance and demonstrate use of method overriding.
- 4. Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods.
- 5. Write a program to demonstrate use of implementing and extending interfaces.
- 6. Write a Java program to implement the concept of creating packages and importing

(12 HOURS)

(10HOURS)

(14 HOURS)

classes from user defined package.

- 7. Write a program to implement the concept of Thread Class.
- 8. Write a program to implement the concept of Exception Handling.
- 9. Write a program using Applet to display a message in the Applet.
- 10. Write programs for using Graphics class.
 - a. To display basic shapes and fill them
 - b. Draw different items using basic shapes
 - c. Set background and foreground colors

Web Reference

- 1. https://www.programiz.com/java-programming
- 2. https://code-exercises.com/
- 3. <u>https://practity.com/765-2/</u>

Pedagogy

Chalk and Talk, PPT

Course Designer

Dr. K.Akila, Dr. Lakshna Arun, Dr. A. Bhuvaneswari

Semester III	Internal Marks:25			External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	CREDITS
21UCG3CC6	INFRASTRUCTURE MANAGEMENT	CORE	90	6	5

Objective

- To describe devices, drivers, configuration task
- To acquire the process of planning and configuring technique
- To understand how to deploy agents
- To monitor and creating reports

Course Outcome:

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

CO NUMBER	CO STATEMENT	Knowledge Level
CO1	Basics of installation and configuration process of Windows 10	K1
CO2	Know the basics of configuration manager and its deployment process	K2
CO3	Managing configuration management systems	К3
CO4	Understanding the SCOM prerequisites and its installation	K1
CO5	Know the Monitoring and creation of Reporting	К2

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	М
CO2	S	М	S	S
CO3	S	S	S	S
CO4	S	М	М	М
CO5	М	S	М	М

S-Strong; M-Medium; L -Low

Syllabus

Unit I: Windows 10 Client OS

(10 Hours)

Introducing Windows 10, Overview of Deploying Windows 10, Configure Devices and Drivers, Perform Post

Unit II: Introduction to SCCM

System Center Configuration Manager Overview, SCCM Features and Capabilities, SCCM Setup & Installation, Configuration Manager Basics, Deploying SCCM Client, User and Device Collections in SCCM

Unit III: Managing Systems with SCCM

Application Management using SCCM, Operating System Deployment using SCCM, Endpoint Protection using SCCM, Troubleshooting SCCM Server, Troubleshooting SCCM Clients, Creating Reports using SCCM Reports

Unit IV: Introduction to SCOM

System Center Operations Manager Overview, SCOM Features and Capabilities, SCOM Setup & Installation, Operations Manager Basics, Deploying SCOM Clients, Management Packs in SCOM

Unit V: Monitoring Systems with SCOM

Managing & Administering SCOM Environment, Managing Alerts using SCOM, Creating Custom Management Packs and Alerts, Troubleshooting SCOM Server, Troubleshooting SCOM Clients, Creating Reports using SCOM Reporting.

Suggested Readings

- 1. Woody Leonhard, Ciprian Rusen. (2021). Windows 10 All-in-One For Dummies
- Kerrie Meyler, Gerry Hampson, Saud Al-Mishari, Greg Ramsey, Kenneth van Surksum, Michael Gottlieb Wiles. (2018). System Center Configuration Manager Current Branch Unleashed. (1st Edition). Sams Publishing.
- 3. Kevin Greene. (2016). Getting Started with Microsoft System Center Operations Manager

Web References

- Windows 10
 - Windows 10 Tutorial 3.5 Hour Windows Guide + Windows 10 Tips
 - Windows 10 for Dummies, Newbies, and other Fine Beginners
- System Center Configuration Manager (SCCM)
 - o System Center Configuration Manager Overview
 - o <u>SCCM Features and Capabilities</u>
 - <u>SCCM Setup & Installation</u>
 - o <u>Configuration Manager Basics</u>
 - Deploying SCCM Client
 - <u>Configuration Manager client application</u>
 - Client installation methods in Configuration Manager
 - User and Device Collections in SCCM
 - Introduction to collections in Configuration Manager
 - Prerequisites for collections in Configuration Manager
 - How to create collections in Configuration Manager
 - How to manage collections in Configuration Manager
 - Application Management using SCCM
 - <u>Create applications in Configuration Manager</u>

(20 Hours)

(20 Hours) point Protect

(20 Hours)

(20 Hours)
- Deploy applications with Configuration Manager
- Manage Applications
- Monitor applications from the Configuration Manager console
- Operating System Deployment using SCCM
 - Introduction to operating system deployment in Configuration Manager
 - Infrastructure requirements for OS deployment in Configuration Manager
 - <u>Scenarios to deploy enterprise operating systems with Configuration Manager</u>
- Endpoint Protection using SCCM
 - Endpoint Protection Overview
 - Endpoint Protection Client
 - <u>Example Scenario: Use Endpoint Protection to protect computers from malware</u>
- <u>Troubleshooting SCCM Server</u>
- Troubleshooting SCCM Clients
- Creating Reports using SCCM Reports
 - Operations and maintenance for reporting in Configuration Manager
 - <u>List of reports in Configuration Manager</u>
- System Center Operations Manager (SCOM)
 - System Center Operations Manager Overview
 - Operations Manager key concepts
 - <u>SCOM Features and Capabilities</u>
 - SCOM Setup & Installation
 - Deploying System Center Operations Manager
 - <u>Single-server deployment of Operations Manager</u>
 - o <u>Operations Manager Basics</u>
 - Management server
 - Web console server
 - Reporting server
 - Operational database
 - Data warehouse database
 - Deploying SCOM Clients

0

- Install Agent on Windows Using the Discovery Wizard
- Management Packs in SCOM
 - What is in an Operations Manager management pack?
 - Management packs installed with Operations Manager
- Managing & Administering SCOM Environment
 - How to connect to the Operations and Web Console
 - Finding data and objects in the Operations Manager consoles
 - <u>Using the Operations Manager Operations console</u>
 - <u>Using the Administration workspace in Operations Manager</u>
- Managing Alerts using SCOM
 - How an alert is produced?
 - <u>Viewing active alerts and details</u>
 - How to suspend monitoring temporarily by using maintenance mode
 - Creating Custom Management Packs and Alerts
 - Management pack templates
 - <u>Create management pack templates</u>
- Troubleshooting SCOM Server
- Troubleshooting SCOM Clients
- Creating Reports using SCOM Reporting
 - <u>Using the Reporting Workspace in Operations Manager</u>
 - <u>How to create reports in Operations Manager</u>

• How to run, save, and export a report

Pedagogy

Chalk and talk, Power point Presentation, Demonstration, e-content

Course Designer

TCS

Semester – III	Internal Marks: 25			Ex	terna	l Marks: 75
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG3AC4	DIGITAL COMPUTER FUNDAMENTALS	ALLIED	60	4	-	3

- To acquire the knowledge and understanding of Digital Electronics concepts
- To impart how to design Digital Circuits.
- To acquire the knowledge of Memory Devices
- To Understand the working mechanism and design guidelines of different combinational, sequential circuits and their role in the digital system design
- To acquire Knowledge of the positive and negative logic, Boolean algebra, logic gates, logical variables, the truth table, number systems, codes, and their conversion from to others.

Course Outcome

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

Co Number	CO statement	Knowledge level
CO 1	Outline the knowledge of Binary conversion, Code system, Logic gates and their circuits, Memory storage.	K1,K2
CO 2	Illustrate the concepts of Digital Principles, Logical Circuit and Memory System	K1,K2
CO 3	Extend the concept of Binary Addition, Subtraction, Multiplication, Division, Boolean Algebra and Logic Gates, Memory Storage.	K1,K2
CO 4	Apply the Concepts of number conversion, Combinational Logic circuits and Sequential Logic Circuits, Memory storage:	K2,K3
CO5	Utilize the Digital concepts of Binary numbers and Binary Codes, Logical Circuits and memory storage	K2, K3

Mapping with programme outcome

CO's	PO1	PO2	PO3	PO4	PO5
CO1	L	S	S	S	S
CO2	L	S	S	М	S
CO3	L	S	S	S	S
CO4	L	S	S	S	S
CO5	L	S	S	S	S

 $S\!-\!Strong;\,M\!-\!Medium;\,L\!-\!Low$

Syllabus

Unit I Number Systems and Codes

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, Gray code, Binary to Excess -3 code conversion and vice versa.

Unit II Boolean algebra and Logic Gates

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 – Universal Building Blocks (UBB) – NAND Gate as UBB – NOR Gate as UBB.

Unit III Combinational Logic Circuits

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:

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.

Unit V Memory and Storage

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 .

10 Hours

10 Hours

10 Hours

15 Hours

15 Hours

Text Books

S.No.	Authors	Title of the book	Publishers	Year of Publication	Edition
1	V.Vijayendran	Introduction to Integrated Electronics: Digital and Analog	<u>Viswanathan</u> <u>S., Printers &</u> <u>Publishers Pvt</u> <u>Ltd</u>	2009	Revised Edition
2	R.P Jain	Modern digital electronics	Tata Mc Graw Hill, New Delhi	2009	Fourth 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	4 th Edition
2	D.A.Godse A.P.Godse	Digital Electronics	Technical publications	2008	3 rd Edition

Web References

https://www.vedantu.com/maths/number-system https://www.electronicshub.org/binary-codes/ https://www.electronics-tutorials.ws/sequential/seq_1.html https://www.electronics-tutorials.ws/combination/comb_1.html https://www.geeksforgeeks.org/what-is-a-storage-device-definition-types-examples/

Pedagogy

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

Course designer

Ms.S.Priya

SEMESTER IV

Semester IV	Internal Marks: 50			External Marks:50		
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG4CC7	DATABASE MANAGEMENT SYSTEMS (Theory &Practicals)	CORE	60+30 =90	4	2	5

- To study the basic concepts of database systems and its Architecture
- To understand Database design and E-R model
- To understand the strategies for storing objects, transaction management, and security
- To inculcate knowledge of Relational database management

Course Outcomes

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

COs	CO Statement	Knowledge Level
CO1	Remember and understand the fundamental concepts of databases	K1,K2
CO2	Classify and make use of the database models	K2,K3
CO3	Utilize and Examine database functionality	K3,K4
CO4	Analyze and Select the queries for data retrieval from the database	K4,K5
CO5	Evaluate a database for real-time applications	K5

Mapping with Programme Outcomes

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

S–Strong; M–Medium; L –Low

Syllabus

UNIT I Database and Database Users: Introduction-Characteristics of the Database Approach-Actors on the Scene-Advantage of Using DBMS Approach-Database System Concepts and Architecture: Data Models, Schema and Instances-Three Schema Architecture and Data Independence –Database Language and Interfaces-The Database System Environment -Centralized and Client/Server Architecture for DBMSs-Classification of Database Management Systems.

UNII II

Relational Model: Structure of Relational Databases - Database Schema - Keys - Schema Diagrams - Relational Query Languages -Formal Relational Query Languages: The Relational Algebra: Fundamental Operation-Additional Relational- Algebra Operations

UNIT III

SQL: Overview of the SQL Query Language - SQL Data Definition - Basic Structure of SQL Queries - Additional Basic Operations - Set Operations - Null Values Aggregate Functions - Nested Subqueries - Modification of the Database -Join Expressions - Views - Transactions - Integrity Constraints - SQL Data Types and Schemas – Authorization.

UNIT IV

Formal Relational Query Languages : The Tuple Relational Calculus - The Domain Relational Calculus- Database Design and the E-R Model: Overview of the Design Process - The Entity-Relationship Model - Constraints-Reduction to Relational Schemas - Entity-Relationship Design Issues - Extended E-R Features.

UNIT V

Basics of Functional Dependencies and Normalization for Relational Databases: Functional Dependencies-Normal Forms Based on Primary Keys-General Definition of Second and Third Normal Forms-Boyce-Codd Normal Form-Multivalued Dependency and Fourth Normal Form- Join Dependencies and Fifth Normal Form.

Text Books

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	RamezElmasri.Shamkant B Navathe(Unit I,V)	Fundamentals of Database Systems	Pearson India Education Services Pvt. Ltd. 7th Edition	2019
2	Abraham Silberschatz, HenryF.Korth,S. Sudharsan(Unit II,III,IV)	Database System Concepts	Mc Graw Hill Education Pvt. Ltd,6th Edition	2017

12 HOURS

12 HOURS

12 HOURS

12 HOURS

12 HOURS

Reference Books

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Alexis Leon &Mathews Leon	Database Management Systems	Vikas Publishing	2008
2	Raghu Ramakrishnan& Johannes Gehrke	Database Management Systems	Tata McGraw Hill Education Pvt. Ltd 3 rd Edition	2003

Web References

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

Practicals List of Exercises

- Write SQL queries to perform DDL & DML operations
- Develop SQL queries to implement the Set operations
- Develop SQL queries to implement the Aggregate functions
- Develop SQL queries to implement Join operations
- Develop SQL queries to implement Nested subqueries
- Develop SQL queries to create a view and expand it
- Develop SQL queries to implement String Operations
- Create a database for a banking enterprise and generate suitable reports

Web References

- 1.<u>https://www.w3resource.com/</u>
- 2.https://www.ntu.edu.sg/home/ehchua/programming/sql/
- 3.https://www.tutorialride.com/

Pedagogy

Quiz, Assignment, Chalk&Talk, Powerpoint Presentation and e-Contents

Course Designer Ms.R.Rita Jenifer

Semester – IV		Internal Mar	External Marks: 60			
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	P	CREDITS
21UCG4AC1P	DIGITAL &	ALLIED	45	-	3	3
	MICROPROCESSOR					
	PRACTICALS					

- 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	K2
	scientific framework.	
CO3	Develop skills in handling equipment.	К3
CO4	Design electronic circuits.	К3
CO5	Build hands on experience using various techniques.	К3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	М	S	S	S	S
CO2	М	S	S	М	М
CO3	S	М	S	М	М
CO4	S	S	М	S	М
CO5	S	М	М	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	Viswanathan S.,	2009	Revised
		Integrated Electronics:	Printers &		Edition
		Digital and Analog	Publishers Pvt		
			Ltd		
2.	B.Ram	Fundamental of	Dhanpat Rai	2013	8 th Edition
		Microprocessor and	Publications(P)		
		microcontroller	Ltd, New Delhi		

Reference Book

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	4 th Edition

Web References

- 1. <u>https://de-iitr.vlabs.ac.in/exp/truth-table-gates/simulation.html</u>
- 2. <u>https://de-iitr.vlabs.ac.in/exp/half-full-adder/simulation.html</u>
- 3. <u>http://vlabs.iitkgp.ernet.in/coa/exp13/index.html#</u>
- 4. <u>https://de-iitr.vlabs.ac.in/exp/realization-of-logic-functions/theory.html</u>

Pedagogy

Demonstration and practical sessions

Course Designer

Ms.N.Manopradha

Semester – IV	Internal Marks: 25			Ex	terna	l Marks: 75
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG4AC5	MICROPROCESSOR & MICROCONTROLLERS	ALLIED	45	3	-	3

- 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	K1, K2
CO 2	Illustrate the knowledge about the instruction sets of 8085 & 8051	K1, K2
CO 3	Distinguish between 8085 and 8051 architecture	K1,K2
CO 4	Outline the functions of peripheral devices	К3
CO 5	Develop skill in simple program writing for 8085 and 8051 based systems	К3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	L	S
CO2	S	М	М	S
CO3	S	S	М	S
CO4	М	М	М	S
CO5	S	S	S	S

S - Strong; M - Medium; L - Low

Unit I 8-bit Microprocessor (8085)

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.

Unit II Microprocessor Programming

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

Unit III Simple Programs

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

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

Unit V Microcontroller (8051)

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

Textbooks

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	5 th Edition
2.	B.Ram	Fundamental of Microprocessor and microcontroller	Dhanpat Rai Publications(P) Ltd, New Delhi	2013	8 th Edition

9 Hours

10 Hours

9 Hours

8 Hours

9 Hours

3.	Muhammad Ali	The 8051	Prentice Hall of India,	2005	2 nd Edition
	Mazidi, Janice	Microcontroller	New Delhi.		
	Gillispie Mazidi,	and Embedded			
	Rolin D. McKinlay	Systems			

Reference books

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

Web References

https://www.tutorialspoint.com/microprocessor/microcontrollers_overview.htm https://www.guru99.com/difference-between-microprocessor-and-microcontroller.html https://www.javatpoint.com/microprocessor-tutorial

Pedagogy

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

Course Designer

Ms. D.Devi

Semester IV	Internal Marks: 40 External Marks:60					
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG4NME2P	MULTIMEDIA PRACTICAL	NME	30	-	2	2

- 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	Explain / Outline the concepts of Multimedia	K2
CO3	Create simple shapes using animation editing software and design simple animation by applying shape tweens and motion tweens	K3
CO4	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	K4
CO5	Design and implement the various graphic and text information in Photoshop	K6

Mapping of CO with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
C01	М	М	S	М	S
CO2	S	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
C05	S	S	S	S	3

List of Exercises

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

Web References

- 1. <u>http://tutorials4computer.blogspot.com/2015/02/procedure-to-create-animation-to.html</u>
- 2. http://dte.kar.nic.in/STDNTS/CS%20IS/multimedia%20lab%20programs.pdf
- 3. <u>https://www.adorama.com/alc/how-to-edit-your-photos-5-photoshop-editing-steps-for-beginners</u>

Pedagogy

Power point Presentation -Content.

Course Designer

Ms. N.Agalya

Semester IV	Internal Marks: 40			E	xternal	Marks: 60
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG4SBE1AP	HTML,CSS, JavaScript PRACTICAL	SBE	30	-	2	2

- To recognize and code the basic structure of web page
- To design and implement static and dynamic website
- To develop web based application using suitable browser side scripting language

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 web design.	K2
CO2	Build real time web applications	K3
CO3	Analyze a web page and identify its elements and attributes	K4
CO4	Compare static and dynamic web pages	K5

Mapping with Programme Outcomes

CO s	PO1	PO2	PO3	PO4
CO1	S	S	М	М
CO2	S	S	S	S
CO3	S	S	М	S
CO4	S	S	S	S

S-Strong; M-Medium; L-Low

List of Exercises

- 1. Write a HTML program for the demonstration of Tags, List, Hyperlinks, Multimedia and Map.
- 2. Write a HTML program using Tables.

- 3. Design Student Registration Form inHTML.
- 4. Write a HTML program to develop a Static web page.
- 5. Develop and demonstrate the usage of inline, internal and external style sheet using CSS.
- 6. Design a webpage using CSS classes and the class attribute.
- 7. Write a JavaScript program to validate User Registration page
 - a) First Name (Name should contain alphabets and the length should not be less than 6 characters)
 - b) Password (Length of the password should not be less than 6 characters)
- 8. Write a JavaScript program to perform different Mathematical operations.
- 9. Demonstrate JavaScript Event-Handler.
- 10. Demonstrate Database connectivity in JavaScript.

Web References

- 1. https://www.w3schools.com/html/html_scripts.asp
- 2. https://www.studytonight.com/javascript/javascript-events
- 3. <u>https://www.tutorialspoint.com/html/html_basic_tags.htm</u>
- 4. <u>https://www.javatpoint.com/javascript-form-validation</u>

Pedagogy

Power Point Presentation, Demonstration

Course Designer

Ms.R. Ramya

Semester IV	Internal Marks: 40			External Marks: 60		
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG4SBE1BP	COMPUTER HARDWARE AND TROUBLE SHOOTING	SBE	30	-	2	2

- To provide basic knowledge about computer configuration and peripherals
- To identify common problems/failures in a Computer System
- To apply a systematic approach in resolving the computer hardware troubleshooting

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 a computer system	K1
CO2	Explain the connection and functions of a computer system and peripheral devices	K2
CO3	Predict the computer hardware problems	К3
CO4	Apply the built in tools and guidelines for troubleshooting	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
C01	S	М	S	М
CO2	S	М	S	М
CO3	S	S	S	М
CO4	S	S	S	S

S-Strong; M-Medium; L-Low

List of Exercises

- 1. Identifying the basic components of a computer system
- 2. Identifying Power supply connection and its function
- 3. Identifying Input, output and storage devices
- 4. Assembling a PC
- 5. Disassembling a PC

- 6. Installation procedure of an operating system
- 7. Installation procedure of a software
- 8. Troubleshooting of BIOS problems, Power supply problems and Mother board Problems
- 9. Troubleshooting of I/O devices problems and other 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

BEHAVIOURAL ORIENTED COURSE

Semester IV	Internal Marks: 100			Ex	xternal	Marks: -
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDIT
21UGCM	CAMPUS TO CORPORATE	BOC	30	2	-	1

Objective:

- To develop confidence and competence in corporate world and BPS industry.
- To enhance communication skills, analytical thinking and professional skills.
- To enrich knowledge of vocabulary, writing skills, presentation skills and managing time and stress.

Course Outcome:

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

COs	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Recall torelate BPS in Corporate society and in the world.	K1
CO2	Illustrate to understand the campus and corporate life in real life situations.	K2
CO3	Develop etiquette skills in workplace and to be groomed in Professional ethics and management for higher research.	K3
CO4	Apply Professional skills in career and build communication skills for a holistic approach.	K3
CO5	Examine LSRW Skills and create a campus corporate world for higher prospects and better learning to tackle problems in society.	K4

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4
C01	М	М	S	S
CO2	S	S	S	S
CO3	S	М	S	S
CO4	S	S	S	М
CO5	М	S	S	S

S-Strong; M-Medium; L-Low

UNIT - I

Syllabus:

Overview of Corporate: Ice-breaker Session, What is Corporate? - History of Corporate. Overview of BPS Industry: What is BPS?- History of BPS - Benefits of BPS - BPS Industry in World - BPS Industry in India - TCS BPS.

Change Management (Understand the difference between campus and corporate life and prepare themselves for the same).Learn the Culture - Impact of your attitude and behavior - Consider the language - Establish and maintain relationship - Respect others - Be Confident - Keep on learning & Consider the body language.

UNIT – III

UNIT – II

Corporate Etiquettes: Dressing and Grooming Skills - Workplace Etiquette - Business Etiquette - Email Etiquette - Telephone Etiquette - Meeting Etiquette & Presentation Skills. Professional Competencies: Analytical Thinking - Listening Skills - Time Management - Team Skills - Assertiveness - Stress Management - Participating in Group Discussion- Interview Facing - Ownership and Attention to detail.

$\mathbf{UNIT} - \mathbf{IV}$

Grammar- Phonetics- One on One basic conversation Skill Practice. Reading Comprehension-Listening Comprehension - Improving Vocabulary - Improving Writing Skills and Comprehension while interacting face to face.

$\mathbf{UNIT} - \mathbf{V}$

Recitation of short stories - Interview Skills - Group Discussion - Social Conversation Skills - Presentation & One Act Plays.

Suggested Readings:

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Alex,K	Soft Skills	S.Chand and Company Ltd, New Delhi	2009
2	Dr. Rita Shanthakumar and Dr.S.Jayashree Agarwal.	A Handbook of Professional Skills	-	-

(6 Hours)

(6 Hours)

(6 Hours)

(6 Hours)

(6 Hours)

Web References

- 1. <u>https://www.careerizma.com/blog/how-to-behave-corporate-world/</u>
- 2. <u>https://www.business-standard.com/company/tcs-5400/information/company-history</u>
- 3. <u>https://www.britannica.com/science/phonetics</u>

Pedagogy

Power Point Presentation, Demonstration, Discussion

Course Designer

TCS

SEMESTER V

Semester V	Internal Mark: 50		Exter	nal	Mark:	50
COURSE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
CODE						
21UCG5CC8	SOFTWARE TESTING	CORE	45+30=	3	2	5
	(Theory & Practicals)		75			

- To understand the basic concepts of Selenium
- To inculcate complex practical skills in Scripting
- To implement the testing concepts using Selenium

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recite the basic concepts of Selenium	K 1
CO2	Identify and examine the test scripts to validate functionality using Selenium	K1, K2
CO3	Explain and demonstrate the software testing based on Selenium	K2, K3
CO4	Apply and analyze various problems using Selenium	K3, K4
CO4	Examine and evaluate the automated test across browsers using Selenium testing tool	K4, K5

Mapping with Programme Outcomes

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

S - Strong; M - Medium; L - Low

Syllabus UNIT I: Selenium Basics

(9 HOURS)

(9 HOURS)

Introduction of Selenium: Selenium's tool suite – How to choose the right Selenium tool for your need- Installation requirements for Selenium. **Installing Selenium Components**: Installing Selenium IDE – Installing Firebug plug-in – Installing the FirePath – Installing JDK – Installing and configuring Eclipse – Installing WinANT.

UNIT II: Selenium IDE and UI Controls

Using Selenium IDE: Selenium IDE interface - Recording Using Selenium IDE - Save and replay the

script using IDE – Inserting / Editing Test steps manually – Adding verifications and asserts with the context menu. **Managing User Interface (UI) Controls:** How does Selenium IDE replay scripts – Locate the elements on a web page – Find XPath using Firefox Add-on.

UNIT III: Create and Verification of WebDriver Script (9 HOURS)

Creating First Selenium WebDriver script: Recording and exporting script from IDE – Configure eclipse to work with Selenium – Running the test. **Selenium Methods:** Selenium WebDriver methods. **Verification Point in Selenium:** Need for a verification point – Inserting a verification point – Understand how to implement a few common validations – Assets statements in Junit.

UNIT IV: Popup Dialogs, Debugging and Reporting (9 HOURS)

Handling Pop-up dialogs and multiple windows: Handle alerts and prompts – Working with multiple windows. **Debugging scripts:** Debugging features – Run Tests in Debug mode with Breakpoints – Step commands, variables and watch. **Reporting in Selenium:** Test Framework Reporting Tools – Configuring Junit HTML Reports – Configuring TestNG Report for your tests – Custom reporting in excel sheets or databases.

UNIT V: Automation Frameworks and Selenium Functions (9 HOURS)

Automation Frameworks: Why do we need automation frameworks – What exactly is an automation framework – Types of frameworks. **Selenium Functions:** How to use JavaScript – How to read rows, columns and cell data from table – working with multiple browsers – working with drop-down lists – working with radio buttons and groups – working with checkboxes.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER/ EDITION	YEAR OF PUBLICATION
1	Navneesh Garg	Test Automation using Selenium WebDriver with Java: step by step Guide	AdactIn Group Pty Ltd.	2014

Reference Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER/	YEAR OF
			EDITION	PUBLICATION
1	Rex Allen Jones - II	Absolute beginner Java 4 Selenium WebDriver: Come learn how to program automation testing	Rex Jones II, CSTE, TMap	2016

Web References

- 1. https://www.tutorialspoint.com/Selenium/Selenium_ide.htm
- 2. https://www.guru99.com/locate-by-link-text-partial-link-text.html
- 3. https://www.geeksforgeeks.org/Selenium-basics-components-features-uses-and-limitations/
- 4. https://www.javatpoint.com/Selenium-tutorial

Practical:

List of Exercises:

- 1. Write a script to open google.com and verify that title is Google and verify that it is redirected to google.co.in
- 2. Write a script to open google.co.in using chrome browser (ChromeDriver)
- 3. Write a script to open google.co.in using internet explorer (InternetExplorerDriver)
- 4. Write a script to create browser instance based on browser name
- 5. Write a script to search for specified option in the listbox
- 6. Write a script to print the content of list in sorted order.
- 7. Write a script to print all the options. For duplicates add entry only once. Use HashSet.
- 8. Write a script to close all the browsers without using quit () method.
- 9. Write generic method in selenium to handle all locators and return web element for any locator.
- 10. Write generic method in selenium to handle all locators containing dynamic wait and return web element for any locator.

Pedagogy

Chalk and talk, Power Point Presentation, Assignment, Demonstration, Quiz and Seminar.

Course Designer

TCS

Semester V	Internal Marks: 50			External Marks:50		
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG5CC9	INTRODUCTION TO DIGITAL TECHNOLOGIES (Theory & Practicals)	CORE	60+30 =90	4	2	5

- To study the basic concepts of Digital Technologies
- To understand about Robotic Process Automation tools
- To develop bots through Automation Anywhere

Course Outcomes

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

COs	CO Statement	Knowledge Level
CO1	Remember and understand the key concepts of digital technologies	K1,K2
CO2	Classify and make use of current technologies	K2
CO3	Implement information in new situations	К3
CO4	Analyze the different use cases	K4
CO5	Evaluate new ideas	K5

Mapping with Programme Outcomes

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

S-Strong; M-Medium; L -Low

12 HOURS

Digital Primer: Why is Digital Different, Digital Metaphors, On Cloud 9, A Small Intro to Big Data, social media & Digital Marketing, Artificial Intelligence, Unchain the Blockchain, Internet of Everything and Immersive Technology.

UNII II

Syllabus

UNIT I

Digital for Industries: Manufacturing and Hi-tech, Banking and Financial Services, Insurance and Healthcare, Retail, Travel & Hospitality, Communications, Media & Information Services and Government.

UNIT III

Automatix - Art of RPA: Introduction - Setting the Context, RPA Prelude, RPA Demystified, RPA vs BPM, RPA Implementations.

UNIT IV

RPA: RPA in Industries, RPA Tools, Automatix. Automation Anywhere: Getting Started with AA Enterprise, Exploring AA Enterprise, AA Enterprise – Architecture. UNIT V

Automation Anywhere: Knowing the Bots, More About TaskBots. AA Enterprise - Assess your All About Recorders, Designers, MetaBots and Cognitive RPA. Learning,

Text Books

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Vaibhav Srivastava	Getting started with RPA using Automation Anywhere: Automate your day-to-day Business Processes using Automation Anywhere	BPB Publications; 1 st edition	2021
2	Arun Kumar Asokan and Nandan Mullakara	Robotic Process Automation Projects: Build Real-world RPA Solutions Using UiPath and Automation Anywhere	Packt Publishing Limited	2020

Reference Books

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Adeel Javed, Anum Sundrani, Nadia Malik & Sidney Madison Prescott	Robotic Process Automation using UiPath StudioX: A Citizen Developer's Guide to Hyper Automation	Apress; 1 st Edition	2021

12 HOURS

12 HOURS

12 HOURS

12 HOURS

2	Jonathan Sireci	The Project Manager's Guide to RPA: A Practical Guide for Deploying Robotics Process Automation		Independently Published (6 June 2021)	2021
		Process Automation		2021)	

Web References

- 1. https://university.automationanywhere.com/training/rpa-learning-trails/getting-started-with-rpa/
- 2. https://university.automationanywhere.com/training/rpa-learning-trails/citizen-developer-basics/
- $3. \ https://university.automationanywhere.com/training/rpa-learning-trails/tips-and-tricks-beginner/$
- 4. https://www.youtube.com/watch?v=G0gVfi7ri7w
- 5. https://www.automationanywhere.com/products/enterprise/community-edition
- 6. https://whatfix.com/blog/digital-transformation-examples/

Practicals

List of Exercises

- 1. Simple bot creation
- 2. Build a bot to automate the action of getting the title of an active window and to automate the action of closing a notepad window.
- 3. Build a bot to automate the task of replacing a few characters from a string.
- 4. Build a bot to automate the task of copying the files from a source folder to the destination folder.
- 5. Build a bot to automate the task of extracting a table from a webpage.
- 6. Build a bot to automate the task of extracting a text from a window and displaying the output.
- 7. Build a bot to automate the task of writing text into a notepad file.
- 8. Build a bot to automate the task of extracting the data from an Excel File according to some condition and storing the extracted data in another file.

Web References

- 1. https://www.edureka.co/blog/automation-anywhere-examples
- 2. https://docs.automationanywhere.com/bundle/enterprise-v2019/page/enterprise-

cloud/topics/aae-client/bot-creator/commands/enter-data-into-webform-from-file.html

Resources

Lab Requirements: Automation Anywhere

Pedagogy

Quiz, Assignment, Chalk & Talk, PowerPoint Presentation and e-Contents

Course Designer

TCS

Semester V	Internal Mark: 50			Ext	ernal N	Iark: 50
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG5CC10	CLIENT RELATIONSHIP MANAGEMENT (Theory & Practicals)	CORE	60+30=90	4	2	5

- To acquire knowledge about ServiceNow platform.
- To get acquainted with various features of ServiceNow platform and tool.
- To use various script types used throughout the platform.

Course Outcomes

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

COs	CO Statement	Knowledge Level
CO1	Understand ServiceNow Intermediate Level	K1
CO2	Acquire ServiceNow features and tools	K2
CO3	Get the database for process automation	К2
CO4	Analyze comprehensive knowledge in ServiceNow Interface	К3
CO5	Evaluate script types throughout the platform	К3

Mapping with Programme Outcomes

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

S-Strong; M-Medium; L -Low

Syllabus

UNIT I:

UNII II:

UNII III:

UNIT IV:

The Interface - Versions, Frames, Important application menus and modules, Content Frame, UI Settings and Personalization. Lists and Forms – List V2 versus List V3, Lists and Tables, Forms.

UI Customization - Branding your Instance, Custom Themes, UI-Impacting System Properties, Configuring Service Portal UI, Creating a Custom Homepage, Styling Pages and Widgets, Setting up the War Room page, and Styling the CMS.

Understanding Data and Relationships – One-to-many relationships in ServiceNow, Many-to-many relationships in ServiceNow, Enforcing one-to-one relationships, Defining Custom Relationships, Database table inheritance.

Tasks and Workflows – Important Task fields, Journals, and the activity formatter, Extending the task table, Workflows, SLAs, Approvals, Assignment, Creating Task fields. UI and Data Policies – UI Policies, Reverse if false, Scripting in UI policies, UI Policy Order, Data Policies, Converting between data and UI Policies, Data Policies Vs ACLs.

UNIT V:

User Administration and Security - Users, Groups and Roles, Emails and Notifications, User Preferences, ACLs – Security Rules. Introduction to Scripting – Client-side versus Server-side APIs, where scripting is supported, Integrated development environment.

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATIO N
1	Tim Woodruff	Learning ServiceNow: Administration and development on the Now platform, for powerful IT automation	2nd Edition, Packt Publishing Ltd.	2018

Web References

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

Text Book

(12 HOURS)

(12 HOURS)

(12 HOURS)

(12 HOURS)

(12 HOURS)

Practical

List of Exercises

- 1. Basic Navigation
 - a. Navigation and the User Interface
 - b. Navigating Applications
 - c. Introduction to Searching
- 2. Managing Records in Lists
 - a. Using Lists
 - b. Finding Information in Lists
 - c. Using Filters and Breadcrumbs
 - d. Editing Lists
 - e. Creating Personal Lists
- 3. Managing Records in Forms
 - a. Forms

Web References

ServiceNow Trainings

- <u>ServiceNow Essentials</u>
- <u>ServiceNow User Interface</u>
- <u>ServiceNow Fundamentals Simulator</u>
- ServiceNow System Administrator Training

Pedagogy

Quiz, Assignment, Chalk & Talk, Power Point Presentation and e-Contents

Course Designer

TCS

Semester V	Internal Marks: 25			External Marks:75			
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS	
21UCG5CC11	VIRTUALIZATION & CLOUD	CORE	60	4	-	4	

- ✤ To understand the advent of distributed computing
- ✤ To become familiar with the concept of data centers
- ✤ To explore the working process of virtualization
- ✤ To acquire the basics of Cloud Computing
- To learn the techniques of Hybrid Cloud Fundamentals

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO1	Define the recent trends in computing and list the basics of cloud computing	K1
CO2	Interpret about Data centers and its transformations	K2
CO3	Apply the concept of Virtualization and identify the technologies of Virtualization.	K3
CO4	Examine and discover the concept of cloud computing	K4
CO5	Assess and perceive the knowledge of Hybrid Cloud	K5

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

Mapping with Programme Outcomes

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

S-Strong; M-Medium; L-Low

Syllabus

UNIT I

(12 HOURS)

Distributed Systems: Overview of Computing Paradigm, Recent trends in Computing, Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing,

Data Center: Data Center Overview, Data Center Evolution, Modern Business Requirements for Data Center, Making Agile Datacenter, Data Center Transformations, Future of Data Centers

UNIT III

UNIT II

Virtualization: Virtualization, Need of Define Virtualization, Virtualization Technologies, Uses of Virtualization, Planning for Virtualization, Virtualization Pitfalls

UNIT IV

Cloud: Cloud Fundamentals, Benefits of Cloud Computing, Type of Clouds, Cloud Computing Services, Cloud Computing Architecture, Virtualization and Cloud Computing, Grid Computing vs Cloud Computing, Security Concerns

UNIT V

Hybrid Cloud: Hybrid Cloud Fundamentals, Benefits of a Hybrid Cloud, Key Considerations for Hybrid Cloud, Components of Hybrid Cloud, Hybrid Cloud Deployment Models, Managing Hybrid Cloud Environments

Text Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	George Coulouris, Jean Dollimore, Tim Kindberg& Gordon Blair	Distributed Systems: Concepts and Design	5 th Edition	2012
2	Josyula	Cloud Computing: Automating the Virtualized Data Center	1 st Edition	2012
3	Brian J,S, Chee, Curtis Franklin Jr	Cloud Computing: Technologies and Strategies of the Ubiquitous Data Center	1 st Edition	2019

Web References

- <u>https://www.tutorialspoint.com/Distributed-Systems</u>
- <u>https://blog.stackpath.com/distributed-system/</u>
- $\circ \quad \underline{https://www.youtube.com/playlist?list=PLJuCep43JwAV117HMP-NZRwmlEn2mzhha}$
- $\circ \ \underline{https://www.youtube.com/playlist?list=PLndqfxA_9SWF-sFpP1Db_E8DmzY3K5Wkq}$
- <u>https://www.guru99.com/cloud-computing-for-beginners.html</u>
- $\circ \quad \underline{https://www.youtube.com/playlist?list=PLDns5jVqEmIoNrmSY0aRHwK5LqGM9u3LL} \\$
- o <u>https://www.youtube.com/playlist?list=PLOspHqNVtKABPTyvxoNW0e4XSgCNdZ40F</u>

(12 HOURS)

(12 HOURS)

(12 HOURS)

(12 HOURS)

Pedagogy

Chalk and talk, Power Point Presentation, e-Content

Course Designer TCS
Semester V	Internal Marks: 25			External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG5MBE1A	COMPUTER ORGANIZATION & ARCHITECTURE	MBE	75	5	-	5

- To discuss the principles of computer organization and the basic architectural concepts.
- To understand the design of the various functional units and components of computers.
- To exemplify in a better way the memory organization, address decoding, basic I/O interfaces and port addressing

Course Outcomes

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

CO Number	CO Statement	Knowledge
		Level
CO1	Recall and summarize the basic concept of computer fundamentals	K1, K2
CO2	Identify and interpret digital representation of data in a computer system	K2, K3
CO3	Discuss and discover the internal structure of the processor and the use of microprogramming.	K3, K4
CO4	Apply and explain the concept of stored program, components of the computers with each other	K3, K5
CO5	Examine and evaluate problems, understand the performance requirements of systems	K4, K5

Mapping with Programme Outcomes

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

S-Strong; M-Medium; L-Low

Syllabus

UNIT I

Basic Concepts and Computer Evolution: Organization and Architecture – Structure and Function. **A Top-level view of Computer Function and interconnection:** Computer Components – Computer function– Interconnection Structures – Bus Interconnection. **Cache Memory:** Computer Memory system overview – Cache memory principles – Elements of Cache design.

UNIT II

Internal Memory: Semi-conductor main memory – Error correction – DDR DRAM – Flash Memory. External Memory: Magnetic disk – RAID – Solid State Drives – Optical memory. Input / Output: I/O Modules – Programmed I/O – Interrupt Driven I/O- Direct Memory Access – Direct Cache Access – I/O Channels and Processors.

UNIT III

Number Systems: The Decimal System – The Binary System – Converting between Binary and Decimal – Hexadecimal Notation. **Computer Arithmetic:** The Arithmetic and Logic Unit – Integer Representation – Integer Arithmetic – Floating Point Representation – Floating Point Arithmetic.

UNIT IV

Instruction Sets: Characteristics and Functions: Machine Instruction characteristics – Types of Operands – Intel x86 and ARM Data Types – Types of Operations. **Instruction Sets:** Addressing Modes and Formats: Addressing Modes – x86 and ARM Addressing Modes – Instruction Formats – Assembly Language. **Processor Structure and Function:** Processor Organization – Register Organization – Instruction Cycle – Instruction Pipelining.

UNIT V

(15 Hours)

Reduced Instruction Set Computers: Instruction Execution Characteristics – Compiler based Register Optimization – Reduced Instruction Set Architecture – RISC Pipelining. **Parallel Processing:** Multiple Processor Organization – Symmetric Multiprocessors – Multithreading and Chip Multiprocessors.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	William Stallings	Computer Organization and Architecture	Pearson Education, 10 th Edition	2017

(**13 Hours**) acture and F

(18 Hours)

(15 Hours)

(14 Hours)

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS / EDITION	YEAR OF PUBLICATION
1	John. P. Hayes	Computer Architecture and Organization	Mc Graw Hill Education, 3 rd Edition	2017
2	C. Hamacher, Z. Vranesic, S.Zaky	Computer Organization	Mc Graw Hill Education, 5 th Edition	2011
3	M.Morris Mano	Computer System Architecture	Prentice Hall, 3 rd Edition	2007

Web References

- 1. https://www.javatpoint.com/computer-organization-and-architecture-tutorial
- 2. https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/
- 3. https://www.learncomputerscienceonline.com/computer-organization-and-architecture/
- 4. https://www.britannica.com/science/computer-science/Architecture-and-organization

Pedagogy

Chalk and talk, Power Point Presentation, Group Discussion

Course Designer

Ms. S. Udhaya Priya

Semester V	Internal Marks: 25			External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	L	Τ	Р	CREDITS
21UCG5MBE1B	PROCESS MANAGEMENT	MBE	75	5	-	5

- To define the work processes in an organization
- To understand the workflows and process controls in Process management
- To manage the processes effectively

Course Outcomes

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

COs	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Define and summarize the process models in software industry	K1, K2
CO2	Interpret and use the agile conceptsin process management	K2, K3
CO3	Apply and correlate the principles of Scrum and DevOps	K3, K4
CO4	Illustrate the strategies work of Design Thinking	K4
CO5	Plan and develop applications using Agile,Scrum and DevOps for real world scenario	K5, K6

Mapping with Programme Outcomes

CO s	PO1	PO2	PO3	PO4	PO5
CO1	S	М	S	М	S
CO2	S	S	М	S	М
CO3	М	S	S	S	S
CO4	S	S	S	М	М
CO5	S	М	S	М	М

S Strong; MM Medium Law Low

Syllabus:

UNIT I

Software and Software Engineering: The Nature of Software - The Unique Nature of WebApps -Software Engineering - Software Process, Software Engineering Practice - Software Myths -Software Process Model: A Generic Process Model - Process Assessment and Improvement -Perspective Process Models - Specialized Process Model - The Unified Process - Software Engineering Code of Ethics.

UNIT II

Agile: Introduction to Agile - Understanding Agile Value - Agile Manifesto - Principles of Agile - Agile Methodologies - Advantages and Disadvantages of Agile - Agile anti-patterns, Scaled Agile Framework - Why Lean UX - The Three Foundations of Lean UX - Principles of Lean UX.

UNIT III

Scrum: Definition of Scrum - Uses of Scrum - Scrum Theory - Scrum Values - The Scrum Team - Scrum Events - Scrum Artifacts - Artifact Transparency.

UNIT IV

DevOps: Introduction to DevOps - Methodologies – Principles and strategies - Automation - Performance Measurement through KPIS and Metrics - Agile and DevOps - Agile Infrastructure, Velocity - Lean Startup UPS.

UNIT V

Design Thinking: Introduction to Design Thinking - Lean thinking, Actionable Strategy - The Problem with Complexity - Vision and Strategy, Defining Actionable Strategy Act to Learn - Leading Teams to Win.

Text Books

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER /	YEAR OF
			EDITION	PUBLICATION
1.	Roger S. Pressman	Software Engineering A	McGraw Hill	2019
		Practitioner's Approach	Education, 8 th	
			Edition	
2.	Andrew Stellman,	Learning Agile	O'Reilly, 1 st Edition	2014
	Jennifer Greene			
3.	Kallori Vikram	Introduction to DevOps	McGraw Hill	2016
			Education	
4.	Jonny Schneider	Understanding Design	O'Reilly	2017
		Thinking, Lean and	Media/Shroff, 1 st	
		Agile	Edition	

(15 HOURS)

(15 HOURS)

(15 HOURS)

(15 HOURS)

(15 HOURS)

Reference Books

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER /	YEAR OF
			EDITION	PUBLICATION
1.	Ken Schwaber, Jeff	Scrum Guide	O'Reilly, 1 st	2017
	Sutherland		Edition	
2.	Jeff Gothelf	Lean vs Agile vs Design	Sense and Respond,	2017
		Thinking	1 st Edition	
3.	Jeff Gothelf,	Lean UX	O'Reilly, 2 nd	2016
	JoshSeiden		Edition	
4.	S. Kenneth Rubin	Essential Scrum: A Practical	Pearson Education,	2015
		Guide to the most popular	1 st Edition	
		Agile Process		

Web References

- https://www.javatpoint.com/software-engineering-agile-model
- https://scrumguides.org/scrum-guide.html
- https://www.techtarget.com/searchitoperations/definition/DevOps
- https://designthinking.ideo.com/
- https://www.tutorialspoint.com/software_engineering/
- https://www.atlassian.com/agile/scrum
- https://www.knowledgehut.com/blog/agile/what-is-agile-scrum
- https://www.altexsoft.com/blog/engineering/devops-principles-practices-and-devops-engineerrole/
- https://www.oreilly.com/library/view/understanding-designthinking/9781491998410/toc01.html

Pedagogy

Chalk and Talk, Power Point Presentation and Seminar

Course Designer

TCS

Semester V	Internal Marks:25]	Exter	nal Marks:75
COURSE CODE	COURSE TITILE	CATEGORY	L	Т	Р	CREDITS
21UCG5MBE1C	COMPUTER GRAPHICS	MBE	75	5	-	5

- To understand the fundamental concepts of Computer Graphics
- To have a knowledge about Clipping and Attributes
- To gain knowledge about 2Dand3D Transformations and Techniques

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Define the basic concepts of Computer Graphics	K1
CO2	Explain about the basic principles of Graphics systems	K2
CO3	Describe the hardware system architecture for Computer Graphics	K2
CO4	Analyze and Apply algorithm to draw different mathematical objects	K3, K4
CO5	Access and Illustrate various 2D, 3D Geometric & modeling techniques	K3, K5

Mapping with Programme Outcomes

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

S-Strong, M-Medium, L- Low

Syllabus

UNIT I

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

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

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.

UNIT IV

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

3D Geometric and Modelling Transformations: Translation – Scaling – Rotation – Other Transformations. **Visible Surface Detection Methods:** Classification of Visible Surface Detection Algorithm – Back face 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	Computer Graphics C	Pearson Education, 2 nd	2022
	M. Pauline Baker	Version	Edition	

Reference Books

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.	Udit Agarwal	Computer graphics	S.K.Kataria & Sons	2013

(12 HOURS)

(15 HOURS)

(18 HOURS)

(18 HOURS)

(12 HOURS)

Web References

- 1. www.tutorialspoint.com
- 2. http://math.hws.edu/graphicsbook
- 3. https://www.researchgate.net/publication/340315732_Lecture1_Computer_Graphics_Introd uction
- 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 Presentation, e-Content

Course Designer

Ms.N.Agalya

Semester V	Internal Marks: 40		External Marks:60			
COURSE CODE	COURSE TITLE	CATEGORY	L	Τ	Р	CREDITS
21UCG5SBE2AP	VIRTUALIZATION & CLOUD PRACTICAL	SBE	30	-	2	2

- To install and create Virtual Machines in Workstation Player
- To apply the knowledge of how to Install and Upgrade VMware Tools
- To Implement how to configure various Virtual Machine Hardware Settings

Course Outcomes

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Demonstrate the workstation Player Preference settings	К2
CO2	Apply the knowledge to install, upgrade and configure on VMware tools	К3
CO3	Examine the knowledge on Virtual Machines	K4

List of Exercises:

- 1. Installing and Using Workstation Player
 - a. Install Workstation Player on a Windows Host
 - b. Start Workstation Player
 - c. Use the Workstation Player Window
- 2. Changing Workstation Player Preference Settings
 - a. Configuring Close Behavior Preference Settings
 - b. Configuring Software Updates Settings
 - c. Configuring Workstation Player Color Theme Settings
- 3. Creating Virtual Machines in Workstation Player
 - a. Preparing to Create a Virtual Machine
 - b. Create a Virtual Machine
- 4. Installing and Upgrading VMware Tools
 - a. Installing VMware Tools
 - b. Upgrading VMware Tools

- c. Configure Software Update Preferences
- d. Configure VMware Tools Updates for a Specific Virtual Machine
- 5. Starting and Stopping Virtual Machines in Workstation Player
 - a. Start a Virtual Machine in Workstation Player
 - b. Power Off a Virtual Machine in Workstation Player
 - c. Use Ctrl+Alt+Delete to Shut Down a Guest
 - d. Suspend and Resume a Virtual Machine in Workstation Player
 - e. Reset a Virtual Machine in Workstation Player
- 6. Changing the Virtual Machine Display
 - a. Configure Display Settings for a Virtual Machine
 - b. Use Full Screen Mode in Workstation Player
- 7. Configuring and Managing Virtual Machines
 - a. Change the Name of a Virtual Machine
 - b. Change the Working Directory for a Virtual Machine
 - c. Change the Virtual Machine Directory for a Virtual Machine
 - d. Change the Memory Allocation for a Virtual Machine
 - e. Moving Virtual Machines
 - f. Delete a Virtual Machine
- 8. Configuring and Managing Devices
 - a. Configuring DVD, CD-ROM, and Floppy Drives
 - b. Configuring and Maintaining Virtual Hard Disks
 - c. Configuring Keyboard Features
 - d. Modify Hardware Settings for a Virtual Machine
- 9. Configuring Network Connections
 - a. Understanding Common Networking Configurations
 - b. Configuring Bridged Networking
 - c. Configuring Network Address Translation
 - d. Configuring Host-Only Networking
 - e. Changing a Networking Configuration
- 10. Configuring Virtual Machine Option Settings
 - a. Configuring General Option Settings for a Virtual Machine
 - b. Configuring Power Options for a Virtual Machine
 - c. Configuring VMware Tools Options for a Virtual Machine
- 11. Configuring Virtual Machine Hardware Settings
 - a. Adding & Removing Hardware to a Virtual Machine
 - b. Adjusting Virtual Machine Memory
 - c. Configuring Virtual Machine Processor Settings
 - d. Configuring and Maintaining Virtual Hard Disks
 - e. Configuring Virtual Network Adapter Settings

f. Configuring Display Settings

Lab Requirements

• Download: <u>VMware Workstation Player</u>

Web References User Guide: <u>Using VMware Workstation Player for Windows</u>

Course Designer TCS

Semester V	Internal Marks: 40			Exte	rnal N	Aarks:60
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG5SBE2BP	DOT NET PRACTICAL	SBE	30	-	2	2

• To impart practical training on Dot Net Programming.

Course Outcomes

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

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Build a web form using server and standard controls	К3
CO2	Apply form validation in Dot Net	К3
CO3	Examine the database connectivity with Dot Net	K4
CO4	Analyze and assess a web portal	K5

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	S	S	S	М
CO2	S	S	М	М
CO3	S	S	М	L
CO4	S	S	М	L

S-Strong; M-Medium; L-Low

List of Practicals

- 1. Demonstrate Ad Rotator and Calendar Control, Login Control
- 2. Design a web form using HTML Server Controls to enter job seeker's details
- 3. Create a web form using Web controls to fill E-Mail registration form
- 4. Validate the E-Mail registration form using the validation controls such as Required Field validator, Regular Expression validator, Compare validator and Range validator
- 5. Data Retrieval, Updating using ADO.NET.
- Create an application using Details view control to perform the basic data manipulations in SQL server database.

- 7. Create an application using Grid view control to access information from a table in SQL server.
- 8. Create an application using Data list control to access information from table in SQL server and display the result in neat format.
- 9. Create a College portal which must include basic database operations

Web References

- 1. https://www.tutorialspoint.com/asp.net
- 2 .https://www.w3schools.com
- 3. https://dotnet.microsoft.com

Pedagogy

Power Point Presentation and e-Contents

Course Designers

- 1. Dr.J.Sangeetha
- 2. Dr.M.Anandhi

SEMESTER VI

Semester VI	Internal Marks: 50			Ex	External Marks:50		
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS	
21UCG6CC12	PYTHON PROGRAMMING (Theory & Practicals)	CORE	60+30 =90	4	2	5	

- To understand the concepts of Python programming language
- To understand the knowledge of Operators, Functions, and Strings
- To inculcate the knowledge of OOPs concept in Python

Course Outcomes

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

COs	CO Statement	Knowledge Level
CO1	Recall execution and debugging of Python program	K1
CO2	Demonstrate the concept of classes and objects using Python	K2
CO3	Make use of Python features to build real-time applications	K3
CO4	Analyze the various functionalities of Python	K4
CO5	Access the performance of inheritance and method overriding	K5

Mapping with Programme Outcomes

COs	PO1	POS2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	М	S	S
CO3	S	S	S	S	М
CO4	S	М	S	М	М
CO5	S	М	S	S	S

S-Strong; M-Medium; L -Low

Syllabus

Theory UNIT I

Basics of Python Programming: Introduction: Python Character Set – Token - Python Core Data Type - The *print ()* Function - Assigning value to a variable - Multiple Assignments - Writing Simple Programs in Python - The *input()* Function - The *eval()* Function- Formatting Number and Strings - Python Inbuilt Functions.

UNII II

Operators, Expressions, Decision and Loop Control Statements: Operators and Expressions -Arithmetic Operators - Operator Precedence and Associatively - Bitwise Operator. **Decision Statement:** Boolean Operators - Using Numbers with Boolean Operators - Using String with Boolean Operators - Boolean Expressions and Relational Operators.

UNIT III

Decision Statements and Loop Control Statements: Decision-Making Statements: Conditional Expressions. **Loop control Statements:** The *while* Loop - The *range()* Function-The *for* Loop - Nested Loops - The *break* Statement - The *continue* Statement.

UNIT IV

Functions and Strings: Syntax and Basics of a Function - Use of a Function - Parameters and Arguments in a Function - The Local and Global Scope of a Variable - The *return* Statement - Recursive Functions - The Lambda Function. **Strings:** The *str* class - Basic Inbuilt Python Functions for String - The *index[*]Operator - Traversing String with *for* and *while* Loop - Immutable Strings - String Operators - String Operations..

UNIT V

Object-Oriented Programming: Class, Objects and Inheritance: Searching Techniques - Introduction to Sorting. **Object-Oriented Programming: Class, Objects and Inheritance:** Defining Classes - The Self-parameter and Adding Methods to a Class - Display Class Attributes and Methods - Special Class Attributes – Accessibility - The_ init Method(constructor) - _del_()(Destructor method) - Method Overloading in Python - Operator Overloading – Inheritance - Types of Inheritance - Inheritance in Detail - Subclass Accessing Attributes of Parent Class -Multilevel Inheritance in Detail- Using *super()* - Method Overriding.

Text Books

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Ashok Namdev Kamthane, Amit Ashok Kamthane	Programming and Problem Solving with Python	MC Graw Hill Education;2 nd Edition	2018

12 HOURS

12 HOURS

12 HOURS

12 HOURS

12 HOURS

Reference Books

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Jeeva Jose and	Introduction to Computing	Khanna Book	2016
	P. Sojan Lal	and Problem Solving with	Publishing;	
		Python	1 st Edition	
2	Ch. Satyanarayana,	Python Programming	(Kindle Edition).	2018
	M Radhika Mani		Universities Press.	
	& B N Jagadesh			

Web References

- 1. https://www.tutorialspoint.com/python/index.htm
- 2. https://www.guru99.com/python-tutorials.html
- 3. https://www.programiz.com/python-programming

Practicals List of Exercises

- 1. Types of Operators
- 2. Control Flow
- 3. Strings
- 4. Functions
- 5. Classes and Objects
- 6. Constructors
- 7. Inheritance
- 8. Method Overriding

Web References

- 1. https://www.shahucollegelatur.org.in/practical.pdf
- 2. <u>https://www.w3schools.com/python/python_operators.asp</u>
- 3. <u>https://mindmajix.com/python/basic-operators-in-python</u>
- 4. <u>https://www.cs.otago.ac.nz/staffpriv/mccane/Downloads/PracticalProgramming.pdf</u>

Pedagogy

Quiz, Assignment, Chalk & Talk, PowerPoint Presentation and e-Contents

Course Designers

Ms. T. Julie Mary Ms. A. Anandhavalli

Semester VI	Internal Marks: 25				Exterr	nal Marks:75
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG6CC13	DATA STRUCTURES & ALGORITHMS	CORE	90	6	-	5

- Understanding Data Structure concept and knowing different ways of organizing data and performing various operations on that data.
- To articulate the essential components of data structures like Stack, Queue, List, Trees& Graphs.
- To get familiarize knowledge with designing an algorithm using data structures

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand data organization & data structure operations	K1,K2
CO2	Design the various types of algorithms and data structure	K2,K3
CO3	Demonstrate problems to represent the linear and non linear structures by recognizing its memory representation and traversal techniques.	K3,K4
CO4	Implement various techniques of algorithms by using suitable data structures	K3,K4
CO5	Analyze the different design technique of algorithm and recommend the technique for practical problems	K4,K5

Mapping with Programme Outcomes

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

S-Strong, M-Medium, L- Low

Syllabus

UNIT I: Linear Data Structures

Introduction and Overview: Introduction - Basic Terminology – Data Structures - Data Structure Operations. **Arrays** – Introduction – Linear Arrays - Representation of Linear Array in Memory -Traversing Linear Arrays - Multidimensional Arrays - Two Dimensional Arrays – Representation of Two Dimensional Array in Memory. **Stacks & Queues:** Array Representation of Stacks - Arithmetic Expressions, Polish Notation - Recursion – Queues– Deques - Priority Queues.

UNIT II: Linked Lists

Overview of Linked List – Representation of Linked Lists in Memory – Traversing a Linked List – Searching a Linked List-Memory allocation; Garbage collection-Insertion into a Linked List – Deletion from a Linked List – Two-way Linked Lists – Operations on Two-way lists.

UNIT III: Non-Linear Structures: Trees & Graphs

Trees: Introduction - Binary Trees – Representing Binary Trees in Memory – Traversing Binary Trees-Header nodes; Threads –Binary Search Trees. **Graphs:** Graph Theory Terminology – Sequential Representation of Graphs: Adjacency Matrix, Path Matrix – Linked representation of a Graph– Traversing a Graph.

UNIT IV: Algorithm

Introduction: Algorithm-Algorithm Specification-Performance Analysis-**Divide & Conquer:** General method- Binary Search-Finding maximum and minimum-Merge Sort-Quick sort. **The Greedy Method:** General Method - Knapsack Problem – Job Sequencing With Deadlines.

UNIT V:

Dynamic programming: General method - All-pairs shortest paths - Single source shortest path - Travelling Sales Person problem. **Back tracking:** The General Method – The 8-Queens Problem – Sum of Subsets – Graph Coloring.

Text Books

S.NO	TITLE	AUTHOR	PUBLISHER /EDITION	YEAR
1	Data Structures	Seymour Lipschutz (Schaum's Series)	McGraw Hill Education (India) Private Limited Ltd., New Delhi, Revised First Edition,	2008
2	Fundamentals of Computer Algorithms	Ellis Horowiz, Sartaj Sahni and Sanguthevar	Galgotia Publications	2015.

(18 HOURS)

(18 HOURS)

(18 HOURS)

(18 HOURS)

(18 HOURS)

Reference Books

S.NO	TITLE	AUTHOR	PUBLISHER /EDITION	YEAR
1	An Introduction to Data	Jean-Paul Tremblay and	Tata McGraw-Hill, New	2017
	Structures with Applications	Paul G. Sorenson	Delhi, Second Edition	
2	Data Structures and	Alfred V. Aho, John E.	Pearson	2006
	Algorithms	Hopcroft and Jeffry D.	Education, New Delhi	
		Ullman		
3	Fundamentals of Data	Ellis Horowiz, Sartaj	Galgotia Publications	2010
	Structure	Sahni		

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

 $3.\ https://www.slideshare.net/canaokar/fundamentals-of-computer-algorithms-by-horowitz-sahni-rajsekaran$

4. https://www.geeksforgeeks.org/data-structures/

Pedagogy

Quiz, Assignment, Chalk-Talk, Power Point Presentations, e-Contents

Course Designer

Ms.K.Sangeetha

Semester VI	VI Internal Marks: 25 External M			Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG6MBE2A	ARTIFICIAL INTELLIGENCE	MBE	75	5	-	5

- To impart the basic concepts, theories and state-of the art techniques of artificial intelligence
- To inculcate problem solving methodologies in the search space
- To introduce most fundamental knowledge representation strategies
- To learn about the future trends of robotics

Course Outcomes

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

COs	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Understand the fundamentals of Artificial Intelligence (AI) and expert systems.	K1
CO2	Identify the type of search strategy that is more appropriate to address a particular problem and implement the selected strategy	K3
CO3	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning	К3
CO4	Analyze the future trends of AI applications	K4
CO5	Assess the importance of knowledge representation in intelligent and expert systems	K5

Mapping with Programme Outcomes

CO s	PO1	PO2	PO3	PO4	PO5
CO1	S	S	М	S	S
CO2	S	S	М	S	М
CO3	S	S	М	М	S
CO4	М	М	М	S	М
CO5	S	S	М	М	S

Syllabus:

UNIT I:

ARTIFICIAL INTELLIGENCE (AI): Computerized Reasoning - Turing Test - What is Intelligence? -Artificial Intelligence- Goals of Artificial Intelligence - History of Artificial Intelligence - Advantages of Artificial Intelligence - Application Areas of Artificial Intelligence - Components of Artificial Intelligence

UNIT II:

PROBLEM REPRESENTATION: Introduction - Problem Characteristics - Problem - Representation in AI - Production System - Conflict Resolution **The Search Process :** Search Process - Strategies for Search - Search Techniques

UNIT III:

GAME PLAYING : Game Playing - Game Tree -Components of a Game Playing Program - Game Playing Strategies - Problems in Computer Game Playing Programs - KNOWLEDGE REPRESENTATION - Introduction - Definition of Knowledge - Importance of Knowledge -Knowledge-Based Systems - Differences Between Knowledge-Based Systems and Database Systems -Knowledge Representation Scheme

UNIT IV:

EXPERT SYSTEMS : Introduction - Definition of an Expert System- Characteristics of an Expert System - Architectures of Expert Systems - Expert System Life Cycle - Knowledge Engineering Process - Knowledge Acquisition - Difficulties in Knowledge Acquisition - Knowledge Acquisition Strategies - Advantages of Expert Systems- Limitations of Expert Systems - Examples of Expert Systems

UNIT V: LEARNING : General Model for Machine Learning Systems - Characteristics of Machine Learning - Types of Learning - Advantages of Machine Learning - Disadvantages of Machine Learning - ARTIFICIAL INTELLIGENCEMACHINES AND ROBOTICS - Introduction - Technical Issues - Applications: Robotics in the Twenty-First Century.

Text Books

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER /EDITION	YEAR OF PUBLICATION
1.	Neeru Gupta, Ramita Mangla	Artificial Intelligence Basics: A Self- TeachingIntroduction	Mercury Learning and Information	2020
2.	Prateek Joshi	Artificial Intelligence with Python	Packt Publishing Limited	2017

Reference Books

S.NO	AUTHORS	TITLE OF THE	PUBLISHER/EDITION	YEAR OF	
		BOOK		PUBLICATION	
	Stuart J. Russell	Artificial Intelligence: A			
1.	and Peter	Modern Approach –	Pearson	2016	
	Norvig	Global Edition			
	Elaine Rich,				
2.	Kevin Knight,	Artificial Intelligence	Tata McGraw Hill,	2017	
	Shivashankar B	Artificial Intelligence	3rd edition	2017	
	Nair				

Web References

- 1. https://intellipaat.com/course-cat/artificial-intelligence-and-machine-learning-courses/
- 2. https://www.youtube.com/hashtag/machinelearningprojectusingpython
- 3. https://cse.iitk.ac.in/users/cs365/2013/readings/am-lecs-intro.pdf

Pedagogy

Chalk and Talk, Power Point Presentation and Seminar

Course Designer

Dr.P. Tamilselvi

Semester VI	Internal Marks: 25			External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG6MBE2B	MOBILE COMPUTING	MBE	75	5	-	5

- •To learn the emerging technologies in mobile computing.
- •To provide the basics of mobile telecommunication system.
- •To be familiar with the network layer protocols and Ad-Hoc networks.
- •To understand the basis of transport and application layer protocols.
- •To gain knowledge about different mobile platforms and application development.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Define the basic concepts of mobile telecommunication	K1
	systems	
CO2	Explain the generations of telecommunication systems	K2
CO3	Identify the functionality of Network layer and its protocols	K3
CO4	Analyze the functions of Transport and Application	K4
	Layer	
CO5	Asses the mobile platforms and applications	K5

Mapping with Programme Outcomes

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

S-Strong; M-Medium; L -Low

Syllabus

UNIT I

Introduction: What is Mobile Computing? – Applications of Mobile Computing- Characteristics of Mobile Computing – Structure of Mobile Computing - Generations of Mobile Communication

(15 HOURS)

Technologies-GSM – Services & Architecture – GSM Security – GPRS-UMTS Architecture.

UNIT II

Mobile Computing: Signal Propagation - Multiplexing –MAC Protocols: Properties, Wireless MAC protocol issues – Fixed Assignment Scheme – Random Assignment Scheme – Reservation based scheme – MAC for Ad Hoc Networks.

UNIT III

Network Layer: Mobile Internet Protocol – Mobile AdHoc Networks: MANET routing protocols - DSDV, DSR, AODV, ZRP, Multicast Routing, and Vehicular Ad Hoc networks (VANET) –MANET Vs VANET – Security.

UNIT IV

Mobile Transport and Application Layer: Traditional TCP – Classical TCP– WAP – Architecture – WDP – WTLS – WTP –WSP.

UNIT V

Mobile Platforms and Applications: Mobile Device Operating Systems – Special Constraints & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone – MCommerce – Structure – Pros & Cons – Mobile Payment System – Security Issues.

PUBLISHER /

EDITION

PHI Learning Pvt.Ltd,

Text Books

S.NO

AUTHOR

1	Jochen Shiller	Communications (Unit II, IV)	New Delhi, Second Edition	2008
2	Prasant Kumar Pattnaik, Rajib Mall	Fundamentals of Mobile Computing (Unit I, III, V)	PHI Learning Pvt.Ltd, New Delhi, Second Edition	2015

TITLE OF THE

BOOK

Mobile

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Asoke K Talukder, Roopa R Yavagal	Mobile Computing	ТМН	2005
2	Raj Kamal	Mobile Computing	Oxford University Press, Third Edition	2018

(15 HOURS)

(15 HOURS)

(17 HOURS)

(13 HOURS)

YEAR OF

PUBLICATION

Web References

- 1. https://digitalthinkerhelp.com/what-is-mobile-computing-advantages-disadvantages-applications/
- 2. https://www.tutorialspoint.com/mobile_computing/mobile_computing_overview.html
- 3. https://nptel.ac.in/courses/117/102/117102062/

Pedagogy

Chalk and talk, Power Point Presentation, E-Content

Course Designer

Dr. A. Bhuvaneswari

Semester VI	Internal Marks: 25	nal Marks: 25 Externals Mark: 75				Mark: 75
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG6MBE2C	DATA MINING & WAREHOUSING	MBE	75	5	-	5

- To understand the basic concepts of data mining
- To understand the design and organization of Data Mining
- Provides an overview of various applications of data mining
- To gain knowledge about various data mining techniques like clustering, association rule mining

Course Outcomes

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

СО	CO STATEMENT	KNOWLEDGE
NUMBER		LEVEL
CO1	Recognize the basic concepts of data mining	K1
CO2	Understand the techniques of data classification using various algorithms	K2
CO3	Explain the simple data classification task and mining strategies in web	K2
CO4	Apply various clustering methods for analysis	К3
CO5	Illustrate the role of data mining techniques in various fields	К3

Mapping with Programme Outcomes

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

Syllabus

UNIT I

Introduction: What is Data Mining - Why Data Mining Now - The Data Mining Process – Data Mining Applications –Data Mining Techniques – Some Data Mining Case Studies – The Future of Data Mining – Data Mining Software. **Association rules mining:** Introduction – Basics – The Task and a Naïve Algorithm – The Apriori Algorithm –Direct Hashing and Pruning (DHP) – Dynamic Itemset Counting (DIC) – Mining Frequent Patterns without Candidate Generation (FP-Growth) – Performance Evaluation of Algorithms – Software for Association Rule Mining.

UNIT II

Classification: Introduction – Decision Tree – Building a Decision Tree - Tree Introduction Algorithm – Split Algorithm Based on the Gini Index – Naïve Bayes Method –Estimating Predictive Accuracy of Classification Methods – Improving Accuracy of Classification Methods – Classification Software. **Cluster Analysis:** what is Cluster Analysis – Desired Features of Cluster Analysis – Types of Data – Computing Distance – Types of Cluster Analysis Methods – Hierarchical Methods – Density-Based Methods Dealing with Large Databases.

UNIT III

Web Data Mining: Introduction – Web Content Mining – Web Usage Mining – Web Structure Mining – Web Mining Software. **Search Engines:** Introduction - Characteristics of Search Engines – Search Engine Functionality – Search Engine Architecture – Ranking of Web Pages

UNIT IV

Data Warehousing: Introduction – Operational Datastore – ETL – Data Warehouse - Data Warehouse Design – Guidelines for Data Warehouse Implementation - Data Warehouse Metadata –Software for ODS, ZLE, ETL and Data Warehousing.

UNIT V

OnLine Analytical Processing: Introduction – OLAP – Characteristics of OLAP System – Data Cube Implementations – Data Cube Operations – Guidelines for OLAP Implementation – OLAP Software. **Information Privacy and Data Mining:** Introduction – What is Information Privacy? – Basic Principles to Protect Information Privacy – Uses and Misuses of Data Mining – Primary Aims of Data Mining – Pitfalls of Data Mining.

(15 HOURS)

(15 HOURS)

(15 HOURS)

(15 HOURS)

(15 HOURS)

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Text Book

S.NO	AUTHORS	TITLE OF THE BOOK	PUBLISHER	YEAR OF
			/EDITION	PUBLICATION
1.	G.K. Gupta	Introduction to Data	Prentice Hall of India	2017
		Mining with Case Studies	Private Limited India,	
			New Delhi, Third	
			Edition	

Reference Books

S.NO	AUTHORS	TITLE OF THE	PUBLISHER	YEAR OF
		BOOK	/ EDITION	PUBLICATION
1.	Jiawei Han,	Data Mining:	Morgan Kaufman	2012
	Michelin	Concepts and	Publishers, Third	
		Techniques	Edition	
2	Margarer H.	Data Mining	Pearson Education	2003
	Dunham	Introductory and		
		Advanced Topics		

Web References

- 1. https://www.geeksforgeeks.org/difference-between-data-warehousing-and-data-mining/
- 2. https://www.guru99.com/data-mining-vs-data-warehouse.html
- 3. https://www.investopedia.com/terms/d/data-warehousing.asp
- 4. http://ideku.net/resources/pptcs1661.pdf
- 5. https://www.javatpoint.com/data-mining-cluster-vs-data-warehousing

Pedagogy

Chalk and Talk, Power Point Presentation, Discussion, Assignment, Case study

Course Designer

Ms.T. Julie Mary

Semester VI	Internal Marks: 25				xterna	ll Marks:75
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG6MBE3A	NETWORK SECURITY	MBE	75	5	-	5

- To provide the fundamental concepts in Network Security
- To analyze various encryption techniques
- To learn the algorithms used for encryption

Course Outcomes

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

CO NUMBER	CO STATEMENTS	KNOWLEDGE LEVEL
CO1	Define and summarize the basic concepts of network security	K1, K2
CO2	Classify and explain the techniques for encryption	K2, K2
CO3	Understand and apply the encryption algorithms	K2, K3
CO4	Summarize and analyze the network and internet security	K2, K3
CO5	Discuss and explain security features for system security	K2, K2

Mapping with Programme Outcomes

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

S-Strong; M-Medium; L -Low

Syllabus

Unit I:

(13 HOURS)

Computer and Network Security Concepts: Computer Security Concepts – OSI Security Architecture - Security Attacks - Security Services – Security Mechanism - A Model for Network Security - Classical **Encryption Techniques**: Symmetric cipher model - Substitution Techniques.

Unit II:

Block Ciphers and the Data Encryption Standard: Data Encryption Standard - An Example DES -The strength of DES – **Advanced Encryption Standard:** AES Structure- AES Transformation Functions - AES Key Expansion.

Unit III:

Block Cipher Operation: Electronic CodeBook – Cipher Block Chaining Mode – Cipher Feedback Mode – Output Feedback Mode – Counter Mode - **Public key Cryptography and RSA:** Principles of Public-key Cryptosystems - The RSA Algorithm.

Unit IV:

Key Management and Distribution: Symmetric-Key Distribution Using Symmetric Encryption -Symmetric-Key Distribution Using Asymmetric Encryption – Distribution of Public keys – X-509 Certificates – Public-key Infrastructure - User Authentication: Remote User-Authentication Principles - Remote User-Authentication using Symmetric Encryption – Kerberos - Remote User-Authentication using Asymmetric Encryption.

Unit V:

Network and internet Security: Electronic Mail Security: Email formats – Email Threats and Comprehensive Email Security – S/MIME – Pretty Good Privacy – **IP security**: IP Security overview – IP Security policy – Encapsulating Security Payload.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	William Stallings	Cryptography & Network Security	Pearson Education, 7 th Edition	2018

Reference Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Charlie Kaufman, Radia Perlman, Mike Speciner	Network Security, Private communication in public world	PHI, 2 nd Edition	2002

(15 HOURS)

(15 HOURS)

(17 HOURS)

(15 HOURS)

Web References

- 1. https://www.slideshare.net/gangadhar9989166446/network-security-cryptography-full-notes
- 2. https://www.vssut.ac.in/lecture_notes/lecture1428550736.pdf

Pedagogy

Chalk and Talk, Power Point Presentation, e-Content

Course Designer

Dr. S. Latha

Semester VI	Internal Mark: 25				External Mark: 75		
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS	
21UCG6MBE3B	HUMAN COMPUTER INTERACTION	MBE	75	5	-	5	

- To understand the fundamental concepts of Human-Computer Interaction
- To learn the concepts of design rules and guidelines prototypes for interactive systems
- To identify the various tools and techniques for interface analysis design and evaluation

Course Outcomes

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

СО	CO CO STATEMENT	
NUMBER		LEVEL
CO1	Understand HCI core writing new programs	K1
CO2	Demonstrate different decision-making statements	K2
CO3	Use the knowledge of Design concepts	K3
CO4	Analyze the evaluation techniques	K4
CO5	Illustrate the design principles	K4

Mapping with Programme Outcomes

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

S - Strong; M - Medium; L - Low

Syllabus

UNIT I

The Interaction: Introduction – Models of interaction – Frameworks and HCI – Ergonomics – Interaction Styles – Elements of WIMP interface – Interactivity – The Context of the interaction - **Paradigm:** Introduction – Paradigms for interaction.

UNIT II

Interaction Design basics: Introduction – What is design? – User focus – Scenarios – Navigation design – Screen design and layout – Interaction and prototyping - **HCI in the software process**: Introduction – The software lifecycle – Usability engineering – Interactive design and prototyping – Design rationale.

UNIT III

Design rules: Introduction – Principles to support usability – Standards – Guidelines – Golden rules and heuristics – HCI patterns - Implementation Support: Introduction – Elements of windowing systems – Programming the application – Using toolkits – User Interface Management Systems. UNIT IV (15 HOURS)

Evaluation Techniques: What is Evaluation? – Goals of Evaluation – Evaluation through expert analysis – Evaluation through user participation – Choosing an evaluation method – **Universal Design:** Introduction – Universal design principles – Multi-modal interaction – Designing for diversity.

UNIT V

User Support : Introduction – Requirements of user support – Approaches to user support – Adaptive help system – Designing user support systems.

Text Books

S.NO	AUTHORS	TITLE OF THE	PUBLISHER	YEAR OF	
		BOOK	/EDITION	PUBLICATION	
1.	Helen Sharp,	Interaction Design:	WILEY, 5th Edition	2019	
	Jennifer Preece,	Beyond Human-			
	Yvonne Rogers	Computer Interaction			
2.	Alan Dix, Janet	Human-computer	Pearson Education, 3rd	2004	
	Finlay, Gregory	Interaction	Edition		
	D.Abowd,				
	Russell Beale				

(15 HOURS)

(15 HOURS)

(15 HOURS)

(15 HOURS)

Reference Books

S.NO	AUTHORS	TITLE OF THE	PUBLISHER	YEAR OF	
		BOOK	/EDITION	PUBLICATION	
1.	Donald Hearn	Computer Graphics C	PHI	2022	
	M. Pauline	Version			
	Baker				
2	John M. Carroll	Human Computer	Pearson Education	2002	
		Interaction in the New			
		Millennium			

Web References

- 1. https://www.interaction-design.org/literature/topics/human-computer-interaction
- 2. https://www.techtarget.com/searchsoftwarequality/definition/HCI-human-computer-interaction
- 3. https://www.tutorialspoint.com/human_computer_interface/human_computer_interface_introdu ction.htm
- 4. https://www.spiceworks.com/tech/artificial-intelligence/articles/what-is-hci/

Pedagogy

Quiz, Assignment, Chalk & Talk, PowerPoint Presentation, e-Content

Course Designer

Dr. K. Akila
Semester VI	Internal Marks: 25 External Marks:7					Marks:75
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG6MBE3C	BIG DATA & IOT	MBE	75	5	-	5

Objective

- To become familiar with the fundamental concepts of Big Data.
- To provide an overview of apache Hadoop.
- To learn the tools and techniques for handling large datasets.
- To understand the concepts of Internet of things.

Course Outcomes

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

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Outline to provide an overview and its classifications of a	K1
	growing field of big data analytics.	
CO2	Use the tools required to manage and analyse big data like	K2
	Hadoop.	
CO3	Apply knowledge using MongoDB & NoSQL.	К3
CO4	Illustrate IoT enabling Technologies	K3
CO5	Recommend the required features of Bigdata and IoT for Real	K4
	time environment	

Mapping with Programme Outcomes

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

S-Strong; M-Medium; L -Low

Syllabus

UNIT I Types of Digital Data: Classification of Digital Data - Characteristics of Data-Evolution of Big Data-Definition of Big Data-Challenges with Big Data- Characteristics of Big Data-Other characteristics of data - Need for Big Data. Big Data Analytics: Characteristics of Big Data analytics- Need for Big Data analytics- Classification of analytics-Greatest challenges that prevent businesses from capitalizing on Big Data -Importance of Big Data analytics - Data science-Data scientist -Terminologies used in Big Data environments - Analytics tools.

UNIT II

Big data Technology: NoSQL - Hadoop. Introduction to Hadoop: Introducing Hadoop- Need for Hadoop - Limitations of RDBMS - RDBMS versus HADOOP - History of Hadoop - Hadoop overview - Interacting with Hadoop ecosystem - HDFS - Processing Data with Hadoop MapReduce -Managing resources and applications with Hadoop YARN - Introduction to MAPREDUCE programming.

UNIT III

Introduction to MongoDB: Need for MongoDB - Terms used in RDBMS and MongoDB - Data types in MongoDB - MongoDB Query Language.

UNIT IV

Introduction to IoT: Physical Design of IoT – Logical Design of IoT – IoT Enabling Technologies – IoT Levels & Deployment Templates - Domain Specific IoTs: Home Automation - Cities -Environment – Energy – Logistics – Retail – Agriculture.

UNIT V

IoT and M2M: Introduction – M2M – Different between IoT and M2M – SDN and NFV for IoT– IoT System Management with NETCONF - YANG: Simple Network Management Protocol (SNMP) - Network operator Requirement.

Text Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER / EDITION	YEAR OF PUBLICATION
1	Seema Acharya, Subhashini Chellappan	Bigdata and Analytics	Wiley India Pvt.Ltd	2015
2	ArshdeepBahga, Vijay Madisetti	Internet of Things A Hands on Approach	University press	2014

(15 HOURS)

(15 HOURS)

(15 HOURS)

(15 HOURS)

(15 HOURS)

Reference Books

S.NO	AUTHOR	TITLE OF THE	PUBLISHER /	YEAR OF
5.110	nernox	BOOK	EDITION	PUBLICATION
1	V.K. Jain	Big Data and Hadoop	Khanna Book Publishing Co.(P) Ltd.,	2017
2	V.Bhuvaneswari T.Devi	Bigdata Analytics A Practioner's Approach	Bharathiyar University, Coimbatore	2016
3	Raj Kamal	Internet of things Architecture and Design Principles	McGraw Hill	2017
4	David Hanes, Gonzalo Salgueiro, Patrick Grossette, Robert Barton, Jerome Henry	IoT Fundamentals, Networking Technologies, Protocols and Use cases for Internet of Things	Cisco Press	2017
5	Olivier Hersent, David Boswarthick, Omar Elloumi	The Internet of Things – Key applications and Protocols	Wiley	2012

Web References

- 1. https://www.mongodb.com/
- $2.\ https://www.tutorialspoint.com/cassandra/index.html$
- 3. https://www.edureka.co/blog/mapreduce-tutorial/
- 4. https://github.com/connectiot/iottoolkit
- 5. https://www.arduino.cc/
- 6. https://emerging-researchers.org/wp-content/uploads/2021/03/ahmed_a_le6.pdf

Pedagogy

Chalk and Talk, Power Point Presentation, E-Content

Course Designers

Dr.J.Sangeetha Dr.M.Anandhi Dr.A.Bhuvaneswari

Semester VI	Internal Marks: -	External Marks: 100			ks: 100	
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG6PW	PROJECT WORK	PROJECT	75	-	5	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

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 will be evaluated based on the following components:

- Problem Identification
- Domain Knowledge
- Documentation
- Presentation

Semester VI	Internal Marks: 40				External Marks: 60		
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS	
21UCG6SBE3AP	MOBILE APPLICATION DEVELOPMENT PRACTICAL	SBE	30	-	2	2	

Objectives

- To design and develop user Interfaces for the Android platform
- To impart practical knowledge in mobile application development

Course Outcomes

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

CO Number	CO Statement	Cognitive Level
CO1	Illustrate the basic concepts of mobile application development	K2
CO2	Experiment with the components of Android studio	К3
CO3	Construct and examine the user interfaces for the Android platform.	K3,K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	М	М	М	S	S
CO2	S	S	М	S	S
CO3	S	S	М	S	М

S-Strong, M-Medium, L-Low

List of Exercises

- 1. Develop a "Hello World" application.
- 2. Develop an application that uses GUI components (Font and Colors.).
- 3. Develop a login module (Check username and password) using activity and Intent.

- 4. Develop a native calculator application using activities and Fragments.
- 5. Develop an application that draws basic graphical primitives on the screen.
- 6. Develop an application that makes use of databases.
- 7. Develop an application that creates an alarm clock.
- 8. Create an application to handle images and videos according to size.
- 9. Develop a native application that uses GPS location information.
- 10. Implement an application that writes data to the SD card.

Web References

- 1. https://www.codingconnect.net/mobile-application-development-lab/
- 2. https://www.iare.ac.in/sites/default/files/lab1/MAD%20LAB.pdf
- 3. https://www.studocu.com/in/document/

Pedagogy

Power Point Presentation, Discussion, Assignment, Demonstration.

Course Designer

TCS

Semester VI	Internal Marks:40			Exter	nal Ma	arks:60
COURSE CODE	COURSE TITLE	CATEGORY	L	Т	Р	CREDITS
21UCG6SBE3BP	MONGODB PRACTICAL	SBE	30	-	2	2

Objective

- Get knowledge about the basic concept of non-relational DBMS.
- Work with query unstructured database
- Define, compare and use the four types of NoSQL Databases (Document-oriented, Key Value Pairs, Column-oriented and Graph).

Course Outcomes

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

COs	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Demonstrate the installation of MongoDB	К3
CO2	Experiment with the basic commands in MongoDB	К3
CO3	Apply the various logical operations in MongoDB	К3
CO4	Examine the Key/Value databases in Modern web development	K4
CO5	Determine the concepts of Transactions Spanning Different Operations	K5

Mapping of CO with Programme Outcomes

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

S - Strong, M - Medium, L – Low

List of Exercises

1. Introduction to MongoDB and its Installation

- 2. Description of Mongo Shell, Create database and show database
- Commands for MongoDB and to study operations in MongoDB Insert, Query, Update, Delete and Projection
- 4. Where Clause equivalent in MongoDB
- Operations in MongoDB AND in MongoDB, OR in MongoDB, Limit Records and Sort Records.
- 6. Operations in MongoDB Indexing, Advanced Indexing, Aggregation and Map Reduce
- 7. Practice with ' macdonalds ' collection data for document oriented database. Import restaurants collection and apply some queries to get specified output.
- 8. Column oriented databases study, queries and practices

Web References

- 1. https://www.mongodb.com/
- 2. https://www.mongodb.com/docs/manual/reference/sql-comparison/
- $3. \ https://www.mongodb.com/docs/manual/reference/method/db.collection.mapReduce/$
- 4. https://www.w3resource.com/mongodb-exercises/index.Database
- $5. \ https://www.kdnuggets.com/2021/02/understanding-nosql-database-types-column-oriented-databases.html$

Pedagogy

Power point Presentation, Demonstration

Course Designers

Ms. T.Julie Mary Ms.A.Anandhavalli