



PSGR Krishnammal College for Women



DEPARTMENT OF COMPUTER SCIENCE

**CHOICE BASED CREDIT SYSTEM (CBCS)
&
LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (LOCF)**

**BACHELOR OF COMPUTER SCIENCE WITH COGNITIVE SYSTEMS
2021 - 2024 BATCH**



Programme Learning Outcomes

After completion of the programme, the student will be able to

- PLO1** : Exhibit in-depth knowledge in the discipline of computer science and skills in providing computerized solution
- PLO2** : Interpret theoretical connections between mind, intelligence, cognition, computation, creativity, information, language and perception
- PLO3** : Apply cognitive, design thinking and critical problem solving skills to establish a productive career in industry, research and academia
- PLO4** : Demonstrate with hands-on experience on current technological tools and effective communicative skills to meet the demands of IT / ITeS / ITIS companies
- PLO5** : Pursue higher studies / employ themselves either as software professionals or entrepreneurs through their technical competencies

Programme Specific Outcomes

The students at the time of graduation will

- PSO1** : Exhibit profound knowledge in cognitive science such as Linguistics, Psychology, Artificial Intelligence and Neuroscience
- PSO2** : Apply skills in the areas like Artificial Intelligence and Machine Learning algorithms, Robotic Process Automation, DevOps Tools, Virtualization and Cloud to design and develop applications

II	V	21PEPS1	Professional English for Physical Sciences	AEC	3	40	5	2	50	50	100	2
II	VI	NM12GAW	General Awareness	AEC	Self-Study	-	-	OT	100	-	-	Grade
III	III	CG21C03	Core 3: Virtualization and Cloud	CC	4	56	4	3	50	50	100	3
III	III	CG21C04	Core 4: Infrastructure Management	CC	4	56	4	3	50	50	100	3
III	III	CG21C05	Core 5: Python Programming	CC	3	41	4	3	50	50	100	3
III	III	CG21CP5	Programming Lab 5 : Virtualization and Cloud Lab	CC	4	60	-	3	25	25	50	3
III	III	CG21CP6	Programming Lab 6: Infrastructure Management Lab	CC	4	60	-	3	25	25	50	3
III	III	TH21A13	Allied A3 : Optimization Techniques	GE	6	86	4	3	50	50	100	5
III	IV	NM21EVS	Foundation Course II: Environmental Studies	AECC	Self-Study	-	-	-	100	-	100	Grade
III	IV	NM21UHR	Foundation Course III: Universal Human Values and Human Rights	AECC	2	26	4	-	100	-	100	2
III	III	CG20SBP1 / CG20SBCE	SBS I - Python Programming Lab / Coursera - Software Testing Tools	SEC	3	45	-	2	40	60	50*	2
III & IV	IV		Job Oriented Course: Data Analytics Qlik Sense	-	-	-	-	3	-	-	-	Grade
IV	III	CG21C06	Core 6 : Software Process Management	CC	4	56	4	3	50	50	100	3
IV	III	CG21C07	Core 7: Data Structures	CC	3	41	4	3	50	50	100	3
IV	III	CG21C08	Core 8: Database Management Systems	CC	3	41	4	3	50	50	100	3
IV	III	CG21C09	Core 9: Java Programming	CC	3	41	4	3	50	50	100	3
IV	III	CG21A01 CG21A02	Allied A4: Paper 1:Cognition and Problem Solving Paper 2:Digital Electronics and Microprocessor Architecture	GE	5	71	4	3	50	50	100	5
IV	III	CG21CP7	Programming Lab 7: DBMS Lab	CC	4	60	-	3	25	25	50	3
IV	III	CG21CP8	Programming Lab 8: Java Programming Lab	CC	3	45	-	3	25	25	50	2
IV	III	CG21SBP2/ CG20SBCE	SBS II-DevOps tools/ Coursera – Software Testing Tools	SEC	3	45	-	2	40	60	50*	2

IV	IV	NM21DTG	Design Thinking	FSPA	2	26	4	2	100	-	100	2
IV	V		NSS/NCC/YRC/Sports& Games	-	-	-	-	-	-	-	100	1
IV		COM15SER	Community Oriented Service	-	-	-	-	-	-	-	-	Grade
V	III	CG21C10	Core 10: Software Testing	CC	4	58	2	3	50	50	100	3
V	III	CG21C11	Core 11: Introduction to Digital Technology	CC	4	58	2	3	50	50	100	3
V	III	CG21C12	Core12: Client Relationship Management	CC	4	58	2	3	50	50	100	3
V	III	CG21E01 CS21E02 CG21E03	Elective 1: Data Mining Elective 2: Big Data Analytics Elective 3: Computer Graphics	DSE	5	73	2	3	50	50	100	5
V	III	CG21CP9	Programming Lab 9: Digital Technology Lab	CC	4	60	-	3	25	25	50	3
V	III	CG21CP10	Programming Lab 10: Client Relationship Management Lab	CC	4	60	-	3	25	25	50	3
V	III	CG20SBCE	Coursera - Software Testing Tools	SEC	3	45	-	-	-	100	50#	2
V	IV	NM21CS1	Cyber Security 1	AECC	2	30	-	-	100	-	100	Grade
V	III	CG20AC1 CG20AC2	Advance Learner Course 1 Paper 1: Multimedia and its Applications Paper 2: Information Management Systems		-	-	-	3	25	75	100*	5*
V	VI		Comprehensive Exam		-	-	-	1	-	100	100	Grade
V	IV	INST1	Field work / Institutional Training		-	-	-	-	100	-	100	2
V			Personality Development		-	-	-	-	-	-	-	Grade

#100 Marks Converted into 50 Marks

*The credit is applicable to candidates who takes up the advanced level course exam- additional credits

CC : Core Course
GE : Generic Elective
AECC : Ability Enhancement Compulsory Course
CA : Continuous Assessment
ESE : End Semester Examination
DSE : Discipline Specific elective
SEC : Skill Enhancement Course

CG21C01

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	M	S	M	M
CLO3	S	S	S	M	M
CLO4	S	S	M	M	S

CG21CP1

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

CG21CP2

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	M	S	S	S
CLO3	S	S	M	S	S
CLO4	S	M	M	S	S

CG21C02

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	S	S	S
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	S	S	M	S	S

CG21CP3

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	M	S	S
CLO3	S	M	S	S	S
CLO4	S	S	S	M	S

CG21CP4

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	M	S
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

21PEPS1

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	M	S	S	M	S
CLO4	S	S	S	M	S
CLO5	S	M	M	S	S

CG21C03

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	S	S	S	M	S
CLO3	M	S	S	S	S
CLO4	S	M	S	M	S

CG21C04

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	M
CLO4	S	M	S	S	S

CG21C05

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	M	M
CLO4	S	S	S	M	S

CG21CP5

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	M
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	M	S	M	S	S

CG21CP6

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	S	S	S
CLO2	S	M	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S

CG20SBP1

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	M	S	S	S
CLO2	S	M	S	M	S
CLO3	S	M	M	S	S
CLO4	M	M	S	S	M

CG21C06

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	M
CLO2	S	S	S	M	S
CLO3	M	S	S	S	S
CLO4	S	S	S	M	S

CG21C07

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	M
CLO2	S	S	M	S	M
CLO3	S	S	M	S	M
CLO4	S	S	S	M	S

CG21C08

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	M	M	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	M	S	M

CG21C09

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	M
CLO2	S	S	M	S	M
CLO3	S	S	M	S	M
CLO4	S	S	S	M	S

CG21A01

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	S	S	S	M	S
CLO3	M	S	S	S	S
CLO4	S	M	S	M	S

CG21A02

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	M	S
CLO2	S	S	M	S	M
CLO3	S	S	S	M	M
CLO4	S	M	S	M	S

CG21CP7

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	S	S	S
CLO2	S	M	S	M	S
CLO3	S	S	M	S	S
CLO4	M	S	S	S	M

CG21CP8

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	S	S	S
CLO2	S	M	S	M	S
CLO3	S	S	M	S	S
CLO4	M	S	S	S	M

CG21SBP2

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	M
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	M	S	M	S	S

Course Number	Course Name	Category	L	T	P	Credit
CG21C01	Operating Systems	Theory	56	4	-	4

Preamble

The objective of the course is to provide knowledge on the functionalities of the client and server operating system. It will enable the students to install, configure, deploy, manage and maintain the operating system. It provides comprehensive coverage on Industry 4.0.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the functionalities of client and server operating systems	K1
CLO2	Gain skills to install, configure and deploy the windows server operating system	K2
CLO3	Managing and maintaining windows server operating system	K3
CLO4	Implementing, managing and maintaining Group Policy, Disk Partitioning, File Management, DHCP, DNS and analyze various Industry 4.0 technologies and automation processes in different domains	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	M	S	M	M
CLO3	S	S	S	M	M
CLO4	S	S	M	M	S

S - Strong; M - Medium; L - Low

Operating Systems - CG21C01**(56 Hrs)****Syllabus****Unit I****11 Hrs**

Operating System Overview - Hardware Basics - Windows 10: Installing, Configuring and Deploying Windows 10 - System Maintenance: Hardware - Managing Disks and Drives - Automating Tasks and Activities.

Unit II**11 Hrs**

Windows Server 2016 - Overview - Working with Windows Servers - Preparing Networking - Navigating Management Options - Managing Servers Remotely - Managing Roles and Features.

Unit III**11 Hrs**

Configuring Server Settings: Server Naming - Managing Processor Scheduling - Allocating Virtual Memory - Active Directory - Understanding - Managing - Maintaining - ADFS - FSMO Roles - Backup and Storage.

Unit IV**13 Hrs**

Deploying Windows Server 2016 - Preparing - Managing Disk Partitions - Implementing TCP/IP networking - Data storage - Partitioning and Optimizing Drives - RAID - Implementing File Sharing - Managing Permissions and Auditing. Group Policy Management - Group Policy for Administration - Print Services - DHCP: Implementing, Managing and Maintaining - DNS: Implementing, Managing and Maintaining.

Unit V**10 Hrs**

Introduction to Industry 4.0 - Need - Reasons for Adopting Industry 4.0 - Definition - Goals and Design Principles - Technologies of Industry 4.0 - Skills required for Industry 4.0 - Advancements in Industry 4.0 - Impact of Industry 4.0 on Society, Business, Government and People - Introduction to 5.0

Text Book

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Bott, Ed, and Craig Stinson	Windows 10 Inside Out (Unit I)	Microsoft Press	2016
2	William R Stanek	Windows Server 2016: The Administrator's Reference (Unit II, III, IV)	Create Space Independent Pub	2016
3	P. Kaliraj, T. Devi	Higher Education for Industry 4.0 and Transformation to Education 5.0 (Unit V)	CRC Press – Taylor and Francis Group	2020

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Svidergol. B Meloski.V, Wright . B, Martinez . S &Bassett . D	Mastering Windows Server 2016	John Wiley & Sons	2018
2	Orin Thomas	Windows server 2016 Inside out	Pearson Education	2017

Web resources

- <https://docs.microsoft.com/en-us/troubleshoot/windows-server>

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies.

Course Designers

- Dr. S. Karpagavalli

Course Number	Course Name	Category	L	T	P	Credit
CG21CP1	Operating Systems Lab	Practical	-	-	60	3

Preamble

The objective of this lab course is to provide the complete knowledge of installation of client / server windows in virtual machine. It will equip the students to perform partitioning management operations, sharing resources and configure network features in the operating system.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understanding the installation of client / server windows in virtual machine and naming the system	K1
CLO2	Illustrate adding roles and features in OS server	K2
CLO3	Demonstrate disk partitioning and replication operations in server	K3
CLO4	Analyze the working of active directory domain service, installation of DNS and DHCP	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S - Strong; M - Medium; L - Low

Operating Systems Lab - CG21CP1

(60 Hrs)

List of Programs

- Install client Windows 10 in virtual machine and naming the system
- Install Windows server 2016 in virtual machine as an administrator
- Managing roles and features of Windows server 2016
- Disk partitioning in MBR and GPT and creating new volume in disk
- Configure and install active directory domain service

- Promote the active directory server to domain controller and replication of Windows server
- Configuring, managing and installation of DNS in Windows server 2016
- Configuring, managing and installation of DHCP in Windows server 2016
- Configuration and deployment of IIS in Windows server 2016
- Mapping network drive for file sharing and printer sharing

Pedagogy

- Demonstration of working environment / Software

Course Designers

- Dr. C. Arunpriya
- Mrs. V. Deepa

Course Number	Course Name	Category	L	T	P	Credit
CG21CP2	Problem Solving using Worksheets Lab	Practical	-	-	30	2

Preamble

The objective of the lab course is to provide the necessary skills to work with worksheets to automate tasks using VBA code.

Course Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Knowledge on working with cell, range, worksheet and workbook	K1
CLO2	Explore the simple programs to perform automation tasks	K2
CLO3	Design forms using ActiveX controls	K3
CLO4	Create charts for data and import / export data from different applications	K4

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	M	S	S	S
CLO3	S	S	M	S	S
CLO4	S	M	M	S	S

S - Strong; M - Medium; L - Low

Problem Solving using Worksheets Lab - CG21CP2

(30 Hrs)

List of Programs

- Working with cells, range, worksheets and workbooks
- Working with simple macros using control structures
- VBA procedures for data analysis
- Simple macros using string, date functions and user defined functions
- Data visualization through charts and graphs
- Import / export data from different applications
- Creating user forms using Activex controls

- VBA programs to work with files / folders

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designers

- Dr. S. Karpagavalli
- Dr. R. Vishnupriya

Course Number	Course Name	Category	L	T	P	Credit
CG21C02	Computer Networks	Theory	56	4	-	4

Preamble

This course is designed to provide knowledge on network, OSI reference model, IP address, routers, switches, various network protocols and network security.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the fundamentals of computer networks and reference models	K1
CLO2	Summarize the purpose of IP address, subnetting and switches	K2
CLO3	Illustrate the working of spanning tree protocol, virtual local area networks and VLAN trunking protocol	K3
CLO4	Analyze the characteristics of network routing, enhanced interior gateway protocol and open shortest path first protocol	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	S	S	S
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	S	S	M	S	S

S - Strong; M - Medium; L - Low

Computer Networks - CG21C02

(56 Hrs)

Syllabus

Unit I

11 Hrs

Introducing Computer Networks - Purpose of Networks - Operation Flow of Computer Networks - Topologies of Computer Networks - The OSI Reference Model: Introduction to the OSI Reference Model - Seven Layers - Benefits of the OSI Reference Model - Introduction the TCP/IP Protocol Suite.

Unit II

11 Hrs

IP Addressing: The Purpose of IP addresses - The Hierarchy of IP Addresses - Subnetting: Subnetting Basics - IP Address Class and Subnet Mask - Variable Length Subnet - Switches: Purpose of switches - Switch functions - Connecting to Cisco Switch - Configuring Cisco Switch - Managing Cisco Switch Authentication.

Unit III**11 Hrs**

Spanning Tree Protocol - Introducing the Spanning Tree Protocol - STP Operation Flow - Introducing Cisco Options for STP - Introducing Rapid Spanning Tree Protocol - Ether Channel - Monitoring STP - Virtual Local Area Networks - Introducing Virtual Local Area Networks- Benefits of VLANs - Managing VLANs - VLAN Trunking - VLAN Trunking Protocol.

Unit IV**11 Hrs**

Network Routing - Introducing Network Routes - Routing Protocols - Routed Protocols - Routing Decision Protocols - Routing Decision Criteria - Routing Methods - Routing Information Protocol - Introducing Routing Information Protocol - Enhanced Interior Gateway Routing Protocol - IGRP - The Foundation of EIGRP - EIGRP Benefits - Characteristics of EIGRP - EIGRP Operation - Open Shortest Path First Protocol - Introducing Open Shortest Path First - OSPF Routing Hierarchy.

Unit V**12 Hrs**

Network Security Basics: Network Zoning - Recognizing Security Risks - Introducing Security Risk Mitigation Methods - IP Access Lists - Purpose of Access Lists - Types of ACLs - Managing ACLs-Creating ACLs - Network Address Translation (NAT) - Purpose of NAT - Operational Flow of NAT.

Text Book

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Silviu Angelescu	CCNA Certification All-in - One For Dummies	For Dummies	1 st Edition

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Behrouz A. Forouzan	Data Communications and Networking	Tata McGraw Hill	5 th Edition, 2017
2	Kurose James F. Ross Keith W.	Computer Networking - A Top-Down Approach	Pearson Education	6 th Edition, 2017
3	William Stallings	Data and Computer Communications	Pearson Education	10 th Edition, 2017

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designers

- Dr. S. Karpagavalli
- Dr. C. Arunpriya

Course Number	Course Name	Category	L	T	P	Credit
CG21CP3	Computer Networks Lab	Practical	-	-	45	3

Preamble

This course imparts a detailed knowledge on designing the structure and topology of different types of networks and on configuring different routing protocols.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Design and setup different topology of network	K1
CLO2	Understand the concept of IP address, switches and routers	K2
CLO3	Apply VLAN and VLAN trunk protocol to connect different networks	K3
CLO4	Implement and configure different types of routing protocols in any one topology	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	M	S	S
CLO3	S	M	S	S	S
CLO4	S	S	S	M	S

S - Strong; M - Medium; L - Low

Computer Networks Lab - CG21CP3

(45 Hrs)

List of Programs

- Topology of network
- Working with IP address, switches and routers
- Static routing protocol
- Routing information protocol
- Virtual local area network
- VLAN trunking protocol
- Spanning tree protocol
- Enhanced interior gateway routing protocol
- Open shortest path first protocol

- Dynamic host configuration protocol
- Telnet
- Point to point with password authentication protocol

Pedagogy

- Demonstration of working environment / Tools / Software / Programs

Course Designers

- Dr. S. Karpagavalli
- Dr. C. Arunpriya

Course Number	Course Name	Category	L	T	P	Credit
CG21CP4	Web Technologies Lab	Practical	-	-	45	2

Preamble

This lab course introduces HTML5 tags, Cascading Style Sheets for web programming. It helps to explore client side scripting language and working with content management systems.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the purpose of HTML5 tags	K1
CLO2	Apply CSS for effective design of web pages	K2
CLO3	Demonstrate the power of scripting language in web development	K3
CLO4	Design and develop dynamic web pages, websites and blogs	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	M	S
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S - Strong; M - Medium; L - Low

Web Technologies Lab - CG21CP4

(45 Hrs)

List of Programs

- Formatting Tag, List Tags
- Image and Anchor Tag, BG Color, Font
- Table Tags
- Frames and Frame sets
- Cascading Style Sheets - Internal, External, Inline
- Radio buttons, Check boxes and List boxes
- Validation using script
- Calculation using script

- Data binding using script
- Content management system
- Design and development of simple web site / blog

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designers

- Dr. S. Karpagavalli
- Dr. R. Kavitha

Course Number	Course Name	Category	L	T	P	Credit
21PEPS1	Professional English for Physical Sciences	Theory	40	5	-	2

Preamble

1. To develop the language skills of students by offering adequate practice in professional contexts.
2. To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year students
3. To focus on developing students' knowledge of domain specific registers and the required language skills.
4. To develop strategic competence that will help in efficient communication
5. To sharpen students' critical thinking skills and make students culturally aware of the target situation.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recognise their own ability to improve their own competence in using the language	K1
CLO2	Use language for speaking with confidence in an intelligible and acceptable manner	K2
CLO3	Read independently unfamiliar texts with comprehension and understand the importance of reading for life	K3
CLO4	Understand the importance of writing in academic life	K3
CLO5	Write simple sentences without committing error of spelling or grammar	K3

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	M	S	S	M	S
CLO4	S	S	S	M	S
CLO5	S	M	M	S	S

S - Strong; M - Medium; L - Low

Unit I - Communication **8 Hrs**

Listening : Listening to audio text and answering question - Listening to instructions

Speaking : Pair work and small group work

Reading : Comprehension passages - Differentiate between facts and opinion

Writing : Developing a story with pictures

Vocabulary : Register specific - Incorporated into the LSRW tasks

Unit II - Description **8 Hrs**

Listening : Listening to process description - Drawing a flow chart

Speaking : Role play (formal context)

Reading : Skimming / Scanning- Reading passages on products, equipment and gadgets

Writing : Process description - Compare and contrast paragraph - Sentence definition and Extended definition - Free writing.

Vocabulary : Register specific - Incorporated into the LSRW tasks

Unit III - Negotiation Strategies **8 Hrs**

Listening : Listening to interviews of specialists / Inventors in fields (Subject specific)

Speaking : Brainstorming (Mind mapping) - Small group discussions (Subject- Specific)

Reading : Longer Reading text.

Writing : Essay Writing (250 words)

Vocabulary : Register specific - Incorporated into the LSRW tasks

Unit IV - Presentation Skills **8 Hrs**

Listening : Listening to lectures

Speaking : Short talks

Reading : Reading Comprehension passages

Writing : Writing Recommendations - Interpreting Visuals inputs

Vocabulary : Register specific - Incorporated into the LSRW tasks

Unit V - Critical Thinking Skills

8 Hrs

Listening : Listening comprehension- Listening for information.

Speaking : Making presentations (with PPT- practice)

Reading : Comprehension passages - Note making. Comprehension: Motivational article on Professional Competence, Professional Ethics and Life Skills)

Writing : Problem and Solution essay - Creative writing - Summary writing

Vocabulary : Register specific - Incorporated into the LSRW tasks

Text Book

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Tamil Nadu State Council for Higher Education (TANSCHÉ)	English for Physical Sciences Semester 1	-	-

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Sreedharan, Josh	The Four Skills for Communication	Foundation books	2016
2	Pillai, G Radhakrishna, K Rajeevan, P Bhaskaran Nair	Spoken English for you	Emerald	1998
3	Pillai, G Radhakrishna, K Rajeevan, P Bhaskaran Nair	Written English for you	Emerald	1998

Course Number	Course Name	Category	L	T	P	Credit
CG21C03	Virtualization and Cloud	Theory	56	4	-	3

Preamble

This course provides an insight on virtualization, cloud services and data centers. It also emphasizes on various cloud service providers, cloud deployment models and hypervisors.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the fundamentals of cloud, essentials of virtualization and data centers	K1
CLO2	Understand the cloud services, service models and virtualization types	K2
CLO3	Apply cloud services and virtualization for effective use of resources	K3
CLO4	Analyze different cloud services, security threats, virtualization and data centers for various business categories	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	S	S	S	M	S
CLO3	M	S	S	S	S
CLO4	S	M	S	M	S

S- Strong; M-Medium; L-Low.

Virtualization and Cloud - CG21C03 Syllabus

(56 Hrs)

Unit I

11 Hrs

Computing Paradigms - Cloud Computing Fundamentals: Motivation for Cloud Computing- **Defining Cloud Computing** - Principles of Cloud computing- Cloud Ecosystem - Requirements for Cloud Services - Cloud Application - **Benefits and Drawbacks. Cloud Computing Architecture and Management: Introduction** - Cloud Architecture - Anatomy of the Cloud - Network Connectivity in Cloud Computing - **Applications on the Cloud - Managing the Cloud** - Migrating Application to Cloud.

Unit II **12 Hrs**
Cloud Deployment Models: Introduction - Private Cloud - Public Cloud - Community Cloud - Hybrid Cloud. Cloud Service Models: Introduction - Infrastructure as a Service - Platform as a Service - Software as a Service - Other Cloud Service Models.

Unit III **11 Hrs**
Virtualization: Introduction - Virtualization Opportunities - Approaches to Virtualization - Hypervisors - Virtualization to Cloud Computing. Security in Cloud Computing: Introduction- Security Aspects- Platform-Related Security - Audit and Compliance.

Unit IV **11 Hrs**
Cloud Service Providers: Introduction - EMC - Google - Sales force - Amazon Web Services: S3 - EBS - EC2 -Dynamo DB - Microsoft - IBM

Unit V **11 Hrs**
Data Centers: Overview of data centers -Data center goals - Data center facilities -Role of data centers in the enterprise - Role of data centers in the service provider environment - Application architecture models - Data center architecture -Data center services.

Text Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	K. Chandrasekaran	Essentials of Cloud Computing (Unit I, II, III & IV)	CRC Press	2015
2	Mauricio Arregoces, Maurizio Portolani	Data Center Fundamentals (Unit V)	Cisco press	2003

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Ray Rafaels	Cloud Computing	Create Space Independent Publishing Platform	2 nd Edition, 2018
2	Curtis Franklin Jr. and Brian Chee	Securing the Cloud: Security Strategies for the Ubiquitous Data Center	Auerbach Publications	2019
3	Dinseh G. Dutt	Cloud Native Data Center Networking: Architecture, Protocols, and Tools	O'Reilly Media	2019

Note:

- Blended mode topics are highlighted. Links will be provided.

Pedagogy

- Lectures, Group discussions, Demonstrations

Course Designers

- Dr. S. Karpagavalli
- Dr. C. Arunpriya

Course Number	Course Name	Category	L	T	P	Credit
CG21C04	Infrastructure Management	Theory	56	4	-	3

Preamble

This course provides fundamental knowledge on system center configuration manager, system center operation manager, a single tool to manage all client environments.

Course Learning Outcomes

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

CLO Number	CO Statement	Knowledge Level
CLO1	Recall the primary configuration management features of SCCM and SCOM	K1
CLO2	Understand the components of SCCM and SCOM to create, manage, deploy and monitor applications	K2
CLO3	Apply configuration manager and operation manager to manage and monitor enterprise infrastructure	K3
CLO4	Analyze enterprise infrastructure management applications using SCCM and SCOM	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	M
CLO4	S	M	S	S	S

S- Strong; M-Medium; L-Low

Infrastructure Management - CG21C04

(56 Hrs)

Unit I

11 Hrs

Implementing Windows 10: User interface - **Switching between desktop mode and tablet mode - Using virtual desktops - Using snap – Cortana** - Windows startup enhancements - Microsoft Edge – Security - Windows 10 upgrade process. Windows 10 deployment options: **Pre-deployments steps - Manual in-place upgrade- Traditional deployments- Windows update approach- OS upgrade via windows server update services.**

Unit II

12 Hrs

Configuration Management Basics: Ten Reasons to Use Configuration Manager - The Evolution of Systems Management - Systems Management Defined - Microsoft's Strategy for Service Management - Overview of Microsoft System Center - The Value Proposition of Configuration

Manager. **Looking Inside Configuration Manager: Design Concepts - Active Directory Integration - A WMI Primer - WMI in ConfigMgr - Components and Communications - Inside the ConfigMgr Database - Viewing Detailed Process Activity- SQL Replication Crash Course - Configuration Manager Database Replication - File-Based Replication.**

Unit III

11 Hrs

Installing System Center 2012 Configuration Manager: Configuring Pre-Installation Requirements - Performing Site Installations - Site Properties - Uninstalling Sites - Troubleshooting Site Installation The Configuration Manager Console: Console Highlights - Touring the Console - ConfigMgr Workspaces - Console Deployment - Role-Based Administration - Connecting to a Site - The In-Console Alert Experience - Configuration Manager Service Manager - Security Considerations - Troubleshooting Console Issues.

Unit IV

11 Hrs

Creating and Managing Applications : ConfigMgr Applications Overview - About Creating Applications - Creating Deployment Types - Creating Detection Methods - Managing and Creating Global Conditions Configuration Manager Queries: Introducing the Queries Node - Creating Queries - ConfigMgr Query Builder - Criterion Types, Operators, and Values - Writing Advanced Queries - Relationships, Operations, and Joins - Using Query Results - Status Message Queries.

Unit V

11 Hrs

Software Update Management: New in 2012 - Incorporated tools - Preparing for software updates with ConfigMgr - Software update building blocks - The software updates process in action. Backup, Recovery, and Maintenance : Performing Site and SQL Server Backups - SQL Replication - Site Maintenance - Database Maintenance - Making the Status Message System to Work - Monitoring Configuration Manager with Operations Manager - Services and Descriptions.

Text Book

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Kerrie Meyler, Byron Holt Marcus Oh Jason Sandys Greg Ramsey	System Center 2012 Configuration Manager Unleashed	Pearson Education	2013

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Santos Martinez , Peter Daalmans , Brett Bennett	Mastering System Center 2012 R2 Configuration Manager	Sybex	1 st Edition, 2017

2	Samir Hammoudi, ChuluunsurenDamdinsuren , Brian Mason &Greg Ramsey	Microsoft System Center Configuration Manager Cookbook	Packt Publishing	2 nd Edition 2016
---	---	--	------------------	---------------------------------

Web Resources

- <https://www.prajwaldesai.com/sccm-console-deployment/>
- <https://www.anoopnair.com/sccm-admin-web-console-softwarecentral-review/>

Note

- Blended mode topics are highlighted. Links will be provided.

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designers

- Dr. S. Karpagavalli
- Ms. P. Parvathi

Course Number	Course Name	Category	L	T	P	Credit
CG21C05	Python Programming	Theory	41	4	-	3

Preamble

The course provides an introduction to python programming constructs such as variables, expressions, function, iterations, lists, tuples, dictionaries and regular expressions. It enables to understand the database connectivity and visualization concepts in python programming.

Course Learning Outcomes

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

CLO Number	CO Statement	Knowledge Level
CLO1	Recall the basic python programming constructs	K1
CLO2	Understand the purpose of functions, string, list, dictionary, tuples files and data retrieval in python	K2
CLO3	Apply the python supported data structures to solve real world problems	K3
CLO4	Analyze the problems and solve using python data types, structures and data handling methods	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	M	M
CLO4	S	S	S	M	S

S- Strong; M-Medium; L-Low

Python Programming - CG21C05

(41 Hrs)

Syllabus

Unit I

9 Hrs

Understanding programming - Conversing with Python - The building blocks of programs - **Variables, expressions, and statements - Values and types - Variables - Variable names and keywords - Statements - Operators and operands - Expressions - Order of operations** - Modulus operator - String operations - **Conditional execution - Boolean expressions - Logical operators** - Conditional execution - Alternative execution - Chained conditionals - Nested conditionals.

Unit II**8 Hrs**

Functions - Function calls - Built-in functions - **Type conversion functions** - Math functions - Random numbers - Adding new functions - Definitions and uses - Flow of execution - **Parameters and arguments** - **Iteration** - **Updating variables** - **The while statement** - **Infinite loops** - **Finishing iterations with continue** - Definite loops using for - Loop patterns - Counting and summing loops - Maximum and minimum loops - **Strings** - **A string is a sequence** - **Getting the length of a string using len** - Looping and counting - The in operator - **String comparison** - **String methods** - **Parsing strings**.

Unit III**8 Hrs**

Files - Persistence - Opening files - Text files and lines - Reading files - Searching through a file - Letting the user choose the file name - Using try, except, and open - Writing files - **Lists** - **A list is a sequence** - **Lists are mutable** - **Traversing a list** - List operations - List slices - List methods - Deleting elements - **Lists and functions** - **Lists and strings** - Parsing lines - Objects and values - Aliasing - List arguments - Dictionaries - **Dictionary as a set of counters** - **Dictionaries and files** - Looping and dictionaries - Advanced text parsing.

Unit IV**8 Hrs**

Tuples - Tuples are immutable - Comparing tuples - Tuple assignment - Dictionaries and tuples - Multiple assignment with dictionaries - The most common words - Using tuples as keys in dictionaries - Regular expressions - Character matching in regular expressions - **Extracting data using regular expressions** - **Combining searching and extracting** - Escape character.

Unit V**8 Hrs**

Using Databases and SQL - Creating a database table - Programming with multiple tables - **Constraints in database tables** - Retrieve and/or insert a record- Storing the friend relationship - Visualizing data - Building aOpenStreetMap from geocoded data.

Text Book

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Dr. Charles R. Severance	Python for Everybody Exploring Data Using Python 3	Shroff Publishers	2017

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Wesley J. Chun	Core Python Programming	Pearson Education Publication	2012
2	Tim Hall and J-P Stacey	Python 3 for Absolute Beginners	Apress	2009

3	Zed Shaw	Learn Python the Hard Way	Addition Wesley	2017
---	----------	---------------------------	-----------------	------

Note

- Blended mode topics are highlighted. Links will be provided.

Pedagogy

- Lectures, Demonstrations

Course Designer

- Mrs. D. Suganthi

Course Number	Course Name	Category	L	T	P	Credit
CG21CP5	Virtualization and Cloud Lab	Practical	-	-	60	3

Preamble

This course provides technical skills on virtualization, creating virtual machines and environment. It also enables the students to explore cloud services.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understanding implementation of virtual machines	K1
CLO2	Demonstrate the key technologies required for setting up IT virtualization and cloud computing infrastructure and private cloud platform using virtualization	K2
CLO3	Apply the key components of Amazon Web Services in problem solving	K3
CLO4	Demonstrate cloud services and cloud programming	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	M
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	M	S	M	S	S

S- Strong; M-Medium; L-Low

Virtualization and Cloud Lab - CG21CP5

(60 Hrs)

List of Programs

- Working with hypervisors
- Creating Virtual Machines
- Cloning Virtual Machines
- Network Virtualization
- SAAS Services
- Creating Private Cloud
- Creating account in AWS
- Exploring AWS services like EC2, S3, Buckets
- Exploring Salesforce

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designer

- Dr. S. Karpagavalli
- Dr. C. Arunpriya

Course Number	Course Name	Category	L	T	P	Credit
CG21CP6	Infrastructure Management Lab	Practical	-	-	60	3

Preamble

The course provides a strong foundation in Configuration and deploying windows operating systems, application, provide endpoint security, and to manage policies and configurations for client machines.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the concepts of workspace in SCCM and SCOM	K2
CLO2	Apply various administration roles and advanced queries using SCCM and SCOM	K3
CLO3	Apply the components protection, monitoring, reporting and administration in SCCM and SCOM	K3
CLO4	Demonstrate the creation of customized dashboard and adding widgets to the dashboard	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	S	S	S
CLO2	S	M	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium; L-Low

Infrastructure Management Lab - CG21CP6

(60 Hrs)

List of Programs

Working with SCOM- Different workspaces and functions of System Center 2012 R2

- Operations Manager
- Monitoring
- Authoring
- Reporting and administration
- Different components of the datacenter infrastructure will be monitored and analyzed using Operations Manager
- SCOM: Create a Custom Dashboard View
- SCOM: Add Widgets to the Dashboard
- SCDPM: Backup System Center Infrastructure

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designers

- Dr. S. Karpagavalli
- Ms. P. Parvathi

Course Number	Course Name	Category	L	T	P	Credit
CG20SBP1	SBS I :Python Programming Lab	Practical	-	-	45	2

Preamble

This course provides hands on experience of python programming and to solve problems using python API's.

Course Learning Outcomes

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

CLO Number	CO Statement	Knowledge Level
CLO1	Understand python programming structure	K1
CLO2	Classify different functions in python programming	K2
CLO3	Apply filesfor data processing	K3
CLO4	Illustrate pattern matching and extra action using regular expression and database connectivity	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	M	S	S	S
CLO2	S	M	S	M	S
CLO3	S	M	M	S	S
CLO4	M	M	S	S	M

S- Strong; M-Medium; L-Low

Python Programming Lab- CG21SBP1

(45 Hrs)

List of Programs

- Exercises to write, test, and debug simple python programs
- Exercises using variables and expressions
- Exercises to explore assignments, conditional and loop statements
- Exercises using functions and iterations
- Exercises using data structures like lists, dictionaries and tuples
- Exercises to do pattern matching using regular expressions
- Exercises using classes and objects
- Exercises to read and write data in files
- Exercises to store, retrieve and access data from data source

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designer

- Mrs. D. Suganthi

Course Number	Course Name	Category	L	T	P	Credit
CG21C06	Software Process Management	Theory	56	4	-	3

Preamble

This course introduces the concepts of software process models, agile project management using Scrum and Lean. It also introduces DevOps tools in software management.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the primary software engineering concepts and recent approaches in software development	K1
CLO2	Understand the various software process models, frameworks and DevOps tools	K2
CLO3	Apply the software practices and tools to design software	K3
CLO4	Analyze the diverse software process models, frameworks, business methodology and tools	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	M
CLO2	S	S	S	M	S
CLO3	M	S	S	S	S
CLO4	S	S	S	M	S

S- Strong; M-Medium; L-Low

Software Process Management–CG21C06

(56 Hrs)

Syllabus

Unit I

12 Hrs

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.

Unit II**11 Hrs**

Agile development: Agility - Agile process - Extreme programming (XP) - Other Agile Process Models. Scrum: Introduction - Scrum Framework - Scrum Roles - Product owner - Scrum Master - Development Team - **Scrum Activities and Artifacts Product Backlog** - Sprints - Sprint Planning and execution - Daily Scrum - Done - Sprint review - Sprint Retrospective.

Unit III**11 Hrs**

DevOps: Introduction to DevOps - Getting started with DevOps - Continuous Integration and Continuous Delivery - The CI/CD principles - Using a package manager - Using Jenkins - Using Azure Pipelines - Using GitLab CI - Containerizing Your Application with Docker - **Installing Docker - Registering on Docker Hub - Docker installation** - An overview of Docker's elements - Creating a Dockerfile - Building and running a container on a local machine - **Pushing an image to Docker Hub.**

Unit IV**11 Hrs**

Lean UX and Agile Integrating Lean UX and Agile -Definitions - Staggered Sprints and their Modern Offshots - Dual Track Agile - Exploiting the Rhythms of Scrum to build a lean UX practice– Participation – Beyond the Scrum Team - **Lean UX and Agile in the Enterprise.**

Unit V**11 Hrs**

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	Author	Title of the Book	Publisher	Year of Publication
1	Roger S Pressman	Software Engineering A Practitioner's Approach (Unit I & II)	MC – Graw Hill Higher Education	7 th Edition, 2017
2	Mikael Krief	Learning DevOps (Unit III)	Packt Publishing Ltd.	1 st Edition, 2019
3	Stephen Haunts	Essential of Scrum (Unit II)	Addison-Wesley Professional	1 st Edition, 2012
4	Jeff Gothelf, Josh Seiden	Lean UX (Unit IV)	O'Reilly Media	2 nd Edition, 2020
5	Jonny Schneider	Understanding Design Thinking, Lean, and Agile (Unit V)	O'Reilly Media	2017

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Ian Sommerville	Software Engineering	Pearson Education	10 th Edition, 2017
2	Ralf Kneuper	Software Processes and Life Cycle Models	Springer	2018
3	James Edge, Agile	An Essential Guide to Agile Project Management, The Kanban Process and Lean Thinking	Create Space Independent Publishing	2018
4	MiteshSoni	Devops for Web Development	Packet Publishing	2016

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designer

- Dr. S. Karpagavalli

Course Number	Course Name	Category	L	T	P	Credit
CG21C07	Data Structures	Theory	41	4	-	3

Preamble

This course imparts the basic concept, terminologies in data structures. It enables to choose appropriate data structures for designing algorithms to solve real world problems.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the basic data structures and data representations	K1
CLO2	Understand different data structures, operations and applications	K2
CLO3	Apply specific data structures like stack, queue, linked list, trees, and graph to solve problems	K3
CLO4	Analyze and evaluate the use of data structures in computerized problem solving	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	M
CLO2	S	S	M	S	M
CLO3	S	S	M	S	M
CLO4	S	S	S	M	S

S- Strong; M-Medium; L-Low

Data Structures - CG21C07

(41Hrs)

Syllabus

Unit I

8 Hrs

Basic Terminologies - Abstract Data type -Data Structure -**Algorithm** - Array Definition - Representation of Array - Ordered List - **Sparse Matrices** - Storage Pool - Garbage Collection - Recursion - **Tower of Hanoi** - Backtracking.

Unit II**9 Hrs**

Stack - Definition and Examples - Data Structure of Stack - Disadvantages of Stack - Applications of Stack - Expressions - Polish Notation - Evaluation of Postfix Expression - Decimal to Binary Conversion - Reversing the String-Queue - Operations on Queue - Static Implementation of Queue - Circular Queue - D-queue - Priority Queue - Applications of Queue.

Unit III**8 Hrs**

Linked List - Operation of List - Array Representation of Linked List - Singly-Linked List - Array and Linked List Comparison - Circular Linked List - Sorting and Searching - Internal & External Sorting - Sorting Techniques - Searching.

Unit IV**8 Hrs**

Tree - Definition of Trees - Terminologies - Common Operations on Trees - Common Uses for Trees - Binary Tree - Binary Tree Representation - Binary Tree Traversal - Threaded Binary Tree - Binary Search Tree - Height Balanced (AVL) Tree - B-Trees - Huffman's Encoding.

Unit V**8 Hrs**

Graph Theory - Definition of Graph - Terminology of Graph - Representation of Graphs - Graph Traversal - Spanning Tree - Shortest Path Problem - Applications of Graph-Tables - Representing Tables - Hashing - Collision - Collision Resolution Techniques - Applications of Hashing.

Text Book

S. No	Author	Title of the Book	Publisher	Year of Publication
1	N.K. Tiwari, Jitendra Agrawal, Shishir K. Shandilya	Data Structures	Dreamtech Press	2 nd Edition, 2019

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Seymour Lipschutz	Data Structures	Tata Mc-Graw Hill	5 th Edition 2009, Reprinted 2014
2	Ellis Horowitz Sartaj Sahni	Fundamentals of Data Structures	Computer Science Press	Reprinted 2017
3	A.T. Berziss, Werner Rheinboldt	Data Structures : Theory & Practice	Academic Press	2 nd Edition, 2014

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designer

- Dr. K. Padmavathi

Course Number	Course Name	Category	L	T	P	Credit
CG21C08	Database Management Systems	Theory	41	4	-	3

Preamble

This course provides an insight on the basics of database, database design, relational model and querying a database. It also gives an overview of NoSQL databases and storing and accessing data in a key/value database MongoDB.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the basic concepts of database management and NoSQL databases	K1
CLO2	Understand DDL, DML SQL statements and PL/SQL programming	K2
CLO3	Apply various queries, PL/SQL program to store and retrieve data from databases	K3
CLO4	Analyze the working of SQL, PL/SQL program, NoSQL database to solve real-world problems	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	M	M	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	M	S	M

S- Strong; M-Medium; L-Low

Database Management Systems - CG21C08

41 Hrs

Syllabus

Unit I

8 Hrs

Database Concepts: Introduction -Relationships - **DBMS** -Relational data model - Integrity rules -**Theoretical relational languages**. Database Design: Data modeling -**Dependency** -Database design - Normal forms - **Dependency diagrams – Denormalization**.

Unit II

8 Hrs

Structured Query Language (SQL): Introduction – DDL - Naming rules and conventions-Data types –**Constraints** – Creating table- Displaying table information - **Altering an existing table– Dropping, renaming, and truncating table** - Table type.Working with tables: DML - adding anew row/record – updating and deleting existing rows/records - Retrieving data from table.

Unit III

8 Hrs

Functions and Grouping:Built-in functions - Grouping data. Joins and Views: **Join -Join types**. PL/SQL: Fundamentals-Block structure - comments - **Data types – Other data types** - Variable declaration - Assignment operation.

Unit IV

9 Hrs

Control Structures and Embedded SQL: Control structures - Nested blocks - SQL in PL/SQL - Data manipulation -**Transaction control statements**. PL/SQL Cursors: **Cursors -Implicit & explicit cursors and attributes–Triggers**.

Unit V

8 Hrs

An overview of NoSQL - **Characteristics of NoSQL – NoSQL storage types** - Advantages and Drawbacks - MongoDB Introduction – **Creating database and Dropping database– Creatingcollection and Dropping collection** – Insert, query and update document.

Text Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Nilesh Shah	Database Systems Using Oracle	PHI	2 nd Edition, 2016
2	Gaurav Vaish	Getting Started with NoSQL	Packt	2013

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Rajesh Narang	Database Management Systems	Prentice Hall of India,	2 nd Edition, 2011
2	PramodSadalge, Martin Fowler	NoSQL Distilled	Addison-Wesley	2012
3	Kristina Chodorow	MongoDB: Definitive Guide	Oreilly	2 nd Edition,2015

Pedagogy

- Lecture, Demonstration

Course Designers

- Mrs. M. Dhivya

Course Number	Course Name	Category	L	T	P	Credit
CG21C09	Java Programming	Theory	41	4	-	3

Preamble

This course is to impart the overview of Java, classes, objects, inheritance, packages, interfaces, string functions, exception handling, multithreading and I/O files operations. It also provides technical skills to design GUI based applications using AWT controls and swing API.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the object oriented concepts, programming constructs in Java	K1
CLO2	Understand the usage of various packages, classes in Java to solve problems	K2
CLO3	Apply Java APIs to solve problems using Swing and JDBC	K3
CLO4	Analyze the problems and solve it by applying appropriate logic using Java language	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	M
CLO2	S	S	M	S	M
CLO3	S	S	M	S	M
CLO4	S	S	S	M	S

S- Strong; M-Medium; L-Low

Java Programming-CG21C09

(41Hrs)

Syllabus

Unit I

8 Hrs

An Overview of Java - Object oriented Programming - Using Blocks of Code - Lexical Issues- **Data Types** - **Variables** - Arrays - Operators - **Control Statements** - Classes - Objects - Constructors - Overloading method.

Unit II**9 Hrs**

Inheritance - Packages -Packages and Member Access - Importing Packages -Interfaces - **Exception Handling - Exception Types - Using Try and Catch** - Nested Try - Throw - Throws -Multithreaded Programming- Thread Model- Thread priorities- Synchronization - Messaging - Runnable Interface - Inter thread Communication - Deadlock - Suspending, Resuming and stopping threads -Using Multithreading.

Unit III**8 Hrs**

String Handling - **String Operations** - Character Extraction - **String Comparison - Searching String** - Modifying String -Primitive Type Wrappers - I/O Basics -Byte & Character Streams- Reading Console Input - Writing Console Output - Reading and Writing Files.

Unit IV**8 Hrs**

Introducing GUI Programming with Swing - Two Key Swing Features - Components and Containers - Swing Packages - A Simple Swing application - Event Handling - Painting in Swing - Painting example - Compute the Paintable area - A Paint Example.

Unit V**8 Hrs**

Java Database Connectivity: Database Server - Database Clients - JDBC - Working with Oracle DB - Registering the Driver - Connecting to a Database - Preparing SQL Statements - Using JDBC - ODBC Bridge Driver to Connect to Oracle Database - Types of ResultSets.

Text Book

S.No	Author	Title of the Book	Publisher	Year of Publication
1	Herbert Schildt	Java : The Complete Reference	McGraw Hill Education	11 th Edition, 2020
2	R Nageswara Rao	Core Java - An Integrated Approach	Dream Tech	2016

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	E. Balaguruswamy	Programming with JAVA	McGraw Hill Professional	6 th edition, 2015
2	Amro SOLIMA	Java Swing Complete Comprehensive Guide	Atlantic Publishers	1 st edition, 2019
3	Paul Deitel and Harvey Deitel	Java How to Program	Pearson Education	11 th edition, 2018

Pedagogy

- Lectures, Group discussions, Demonstrations

Course Designer

- Ms. P. Parvathi

Course Number	Course Name	Category	L	T	P	Credit
CG21A01	Cognition and Problem Solving	Theory	71	4	-	5

Preamble

This course is designed to provide a comprehensive overview of topics related to the information-processing mechanisms of the mind, including consciousness, perception, attention, memory, conceptual knowledge, and emotions.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the basic concepts and terminologies in cognitive psychology	K1
CLO2	Understand the proportional relationships from verbal, graphical, symbolic or numerical scenarios	K2
CLO3	Apply knowledge and understanding of well-established theories in cognitive psychology and demonstrate the use of traditional research designs in cognitive psychology	K3
CLO4	Analyze cognitive science concepts including perception, attention, learning, memory, reasoning, problem-solving, judgment, and decision-making	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	S	S	S	M	S
CLO3	M	S	S	S	S
CLO4	S	M	S	M	S

S- Strong; M-Medium; L-Low

Cognition and Problem Solving - CG21A01**(71 Hrs)****Syllabus****Unit I****14 Hrs**

Introduction to Cognitive Psychology: Introduction - What Is Cognitive Psychology- Psychology B.C.-Structuralism – Functionalism- Behaviourism - Early Memory Researchers - Gestalt Approach - Emergence of cognitive psychology - Information-Processing: A Computer Metaphor for Cognition: Connectionism, Alternate approaches to cognitive psychology, Research Methods in Cognitive Psychology: Descriptive Research - Experimental Research.

Unit II**14 Hrs**

Perceptual Processes: Basic Issues In Perception - Bottom-Up and Top-Down Processing - Basic Tasks of Visual Perception - Multisensory Interaction and Integration- Synesthesia - Comparing the Senses - Perception and Action - Change Blindness - Attention and Consciousness.

Unit III**15 Hrs**

Working Memory: Introduction - Classical Research on Short-Term Memory - Brown/Peterson & Peterson Technique - Serial Position Effect - Semantic Similarity of the Items in Short-Term Memory - Atkinson & Shiffrin's Model of Information Processing - Turn to Working Memory - Evidence for Components with Independent Capacities - Phonological Loop - Neuroscience Research on the Phonological Loop - Long-Term Memory - Memory Strategies and Metacognition.

Unit IV**14 Hrs**

Problem Solving and Creativity: Introduction - Understanding the Problem - Methods of Representing the Problem - Symbols - Matrices - Diagrams - Visual Images - Situated and Embodied Cognition Perspectives on Problem Solving - Situated Cognition - Embodied Cognition - Problem-Solving Strategies - Analogy Approach - Structure of the Analogy Approach - Means-Ends Heuristic - Research on the Means-Ends Heuristic - Computer Simulation - Hill-Climbing Heuristic - Factors That Influence Problem Solving - Deductive Reasoning and Decision Making.

Unit V**14 Hrs**

Future Skills - Critical thinking - Adaptive thinking - Cognitive Load Management - Design thinking - Virtual Collaboration - Cultural Sensitivity.

Text Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Thomas A. Farmer, Margaret W. Matlin	Cognition (Unit I, II, III & IV)	Wiley Publication	10 th Edition, 2019
2	Riegler, B.R., Reigler, G.L.	Cognitive Psychology – Applying the Science of Mind (Unit I & II)	Pearson Education	4 th Edition, 2016

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Daniel Reisberg	Cognition: Exploring the Science of the Mind	W. W. Norton & Company	7th edition, 2018
2	E. Bruce Goldstein	Cognitive Psychology: Connecting Mind, Research, and Everyday Experience	Cengage Learning	5 th edition , 2018
3	Benjafield J G	Cognition	Oxford University Press	3 rd Edition, 2010

Web Resources

- https://en.wikibooks.org/wiki/Cognition_and_Instruction/Problem_Solving_Critical_Thinking_and_Argumentation (Unit - V)

Pedagogy

- Lectures, Group discussions, Assignment

Course Designers

- Dr. S. Karpagavalli

Course Number	Course Name	Category	L	T	P	Credit
CG21A02	Digital Electronics and Microprocessor Architecture	Theory	71	4	-	5

Preamble

This course provides the basic concepts of logic gates along with the function of Boolean algebra and explores all the aspects of microprocessor family and interfacing techniques. The key aspects like Intel 80XXX series, Pentium-4, ARM and Embedded systems have been included.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Define the functions of all logical circuits and Boolean algebra concepts	K1
CLO2	Understand the working principles of gates, adders, flip-flops, instruction sets and processors	K2
CLO3	Apply digital logic in designing logic circuits for various operations	K3
CLO4	Analyze the functioning of different processor and logic circuits	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	M	S
CLO2	S	S	M	S	M
CLO3	S	S	S	M	M
CLO4	S	M	S	M	S

S- Strong; M-Medium; L-Low.

Digital Electronics and Microprocessor Architecture - CG21A02

(71 Hrs)

Syllabus

Unit I

14 Hrs

Logic Circuits: Gates - AND,OR,NOT, NAND,NOR Gates & Truth Tables-Boolean Algebra - Karnaugh maps, Product of Sums method, Sum of product method, Don't Care condition – Multiplexers, Demultiplexers- Flip flops: RS, JK,D,T-Decoders.

Unit II

14 Hrs

Shift Register, Half adder, Full adder, BCD Adder, Semiconductor memories: ROM, RAM, Digital Recording Techniques, Micro Programmed Control: Control Memory-Address Sequencing- Design of Control Unit.

Unit III

14 Hrs

Microprocessor: Characteristics of Microprocessors-Interconnection Structures-Interprocessor Arbitration-Interprocessor Communication and Synchronization-Microprocessor architecture & its operations - Direct memory Access (DMA) and the 8237DMA controller.

Unit IV

15 Hrs

The 8085 Programming model: Instruction classification- Instruction format- How to write, assemble and execute a simple program- Overview of the 8085 Instruction set-Programming techniques: Looping, counting and indexing- Additional data transfer and 16 bit arithmetic instructions.

Unit V

14 Hrs

Intel 8086 Microprocessor-Interfacing Devices-Intel 80XXX series-Introduction – Architecture-Fundamentals of ARM Processor - Pentium 4 -Embedded Systems.

Text Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	M. Morris Mano	Computer Architecture and System	Pearson Education	3 rd Edition, 2007
2	R.S. Kaler	Microprocessor and Microcontroller	I K International Publishing House	3 rd Edition 2019

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Ramesh Gaonkar	Microprocessor Architecture Programming and Applications with the 8085	Microprocessor Architecture Programming and Applications with the 8085	5th Edition, 2011
2	A NagoorKani	Microprocessor and Microcontrollers	McGraw Hill Education	2 nd Edition, 2017
3	M Morris Mano Michael D Clietti	Digital Design	Pearson Education	4 th Edition, 2013

Pedagogy

- Lectures, Group discussions, Assignment, Quiz

Course Designer

- Mrs. D. Suganthi

Course Number	Course Name	Category	L	T	P	Credit
CG21CP7	DBMS Lab	Practical	-	-	60	3

Preamble

The lab course provides a way to explore storing and accessing data in database through query languages and PL/SQL programming language. It enables to experience a NoSQL key/value store database MongoDB.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand basic SQL query statements	K2
CLO2	Gain knowledge on primary and foreign key constraints	K2
CLO3	Apply functions and joins on data	K3
CLO4	Demonstrate PL/SQL programming on databases and differentiate Key/value store database from relational database	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	S	S	S
CLO2	S	M	S	M	S
CLO3	S	S	M	S	S
CLO4	M	S	S	S	M

S- Strong; M-Medium; L-Low.

DBMS Lab - CG21CP7

(60 Hrs)

List of Programs

- Exercise using different data types and operators
- Exercise using integrity constraints
- Exercise to implement built-in functions
- Exercise to implement update and alter table
- Exercise to implement PL/SQL table and record

- Exercise to implement splitting and joining the table
- Exercise using Functions
- Exercise using Cursors
- Exercise using Triggers
- Exercise to create and drop database in MongoDB
- Exercise to create and drop collection in MongoDB
- Exercise to insert, query and update document in MongoDB

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designers

- Dr. S. Karpagavalli

Course Number	Course Name	Category	L	T	P	Credit
CG21CP8	Java Programming Lab	Practical	-	-	45	2

Preamble

The lab course provides a way to build software development skills to solve real world problems. It helps to explore inheritance, polymorphism, interfaces and multithreading concepts.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the fundamentals of programming such as variables, conditional statements, classes, constructors and method overloading to process data	K2
CLO2	Apply the principles of packages, manipulate threads and exception handling techniques to analyze problems	K3
CLO3	Implementation of Multi-tasking application programs using threads and developing different I/O Stream oriented applications	K3
CLO4	Demonstrate GUI based window application using Swings and JDBC	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	S	S	S
CLO2	S	M	S	M	S
CLO3	S	S	M	S	S
CLO4	M	S	S	S	M

S- Strong; M-Medium; L-Low.

Java Programming Lab-CG21CP8

(45Hrs)

List of Programs

- Exercise using control statements and operators
- Exercise to implement Classes, Constructors, Overloading
- Exercise to implement overloading methods
- Exercise to implement inheritance
- Exercise to implement interfaces
- Exercise to implement packages

- Exercise using multithreading
- Exercise to implement exception concepts
- Exercise to implement string functions
- Exercise to implement file streams
- Exercise to implement swing components
- Exercise to implement JDBC Components

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designer

- Ms. P. Parvathi

Course Number	Course Name	Category	L	T	P	Credit
CG21SBP2	DevOps Tools	Practical	-	-	45	2

Preamble

This course is designed to provide the fundamental understanding of DevOps. It enables to analyze, design, deploy and test software applications in an environment.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the concept of technologies and methodologies in DevOps	K2
CLO2	Demonstrate Jenkins concepts to build, deploy and test software applications	K2
CLO3	Implement the drivers responsible for the emergence of DevOps	K3
CLO4	Illustrate the deployment of concepts and practices in IT Service Management and apply DevOps in an enterprise environment	K4

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	M
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	M	S	M	S	S

S- Strong; M-Medium; L-Low

DevOps Tools- CG21SBP2

(45

Hrs)List of Programs

- Version Control System using Github
- Push and Pull methods in Github
- Build automation using Maven
- Building jobs using Jenkins
- Configuring Email Notification in Jenkins
- Pulling images in Docker container
- Working with Docker Networks

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designers

- Dr. S. Karpagavalli

Course Number	Course Name	Category	L	T	P	Credit
CG21C10	Software Testing	Theory	58	2	-	3

Preamble

This course provides an insight on different software testing techniques, automation tools and test management. It emphasizes on test automation using selenium components, web driver methods and data driven testing.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the software testing basics, automation and test management	K1
CLO2	Understand the types of software testing, test automation tools and techniques	K2
CLO3	Apply various software testing methods in writing test cases / test scripts	K3
CLO4	Analyze the software and apply manual or automated software testing	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	S	S	S
CLO3	M	S	S	S	M
CLO4	S	S	S	M	S

S-Strong; M-Medium; L-Low.

Software Testing -CG21C10

(58 Hrs)

Syllabus

Unit I

12 Hrs

Introduction to Testing: The Evolving Profession of Software Engineering - The Role of Process in Software Quality - Testing as a Process. Testing Fundamentals: **Introduction - Basic Definitions** - Software Testing Principles- Test Goals, Policies, Plans, And Documentation: Testing and Debugging Goals and Policies - Test Planning - Test Plan Components - **Test Plan Attachments- Test Design Specifications** - Test Case Specifications - Test Procedure Specifications - Locating Test Items - The Test Transmittal Report - **Reporting Test Results.**

Unit II**12 Hrs**

White Box Testing - Static Testing - Structural Testing - Black Box Testing - **Positive and Negative Testing** - Boundary Value Analysis - Equivalence Class Partitioning -Integration Testing - Types of Integration Testing - **System Testing** - Functional Testing - **Non-Functional Testing** - Acceptance Testing.

Unit III**12 Hrs**

Software Test Automation: Test automation -**Need and Scope for Automation** - Criteria for Selecting a Testing Tool -**Test Automation Tools** - Introduction to Selenium - Installing Selenium Components - Using Selenium IDE - Managing User Interface Controls - **Basics of Java**- Creating First Selenium Web Driver Script.

Unit IV**11 Hrs**

Selenium Methods - Common Selenium Web Driver Methods - **Verification Point in Selenium - Features of Web Driver** - Locators - Handling Pop-up Dialogs and Multiple Windows - Working with Dynamic UI Objects.

Unit V**11 Hrs**

Selenium Functions: Using JavaScript - **Minimize and Maximize the Browser Window** -Working with Dropdown Lists - **Working with Radio Buttons and Check Boxes** -Xpath and Properties Finder -Data driven testing using Parameterization - Reporting in Selenium - Batch Execution- Automation Frameworks - **Sample test cases for Automation.**

Text Books

S. No	Author	Title of the Book	Publishers	Year of Publication
1	Ilene Burnstein	Practical Software Testing: A Process-Oriented Approach	Springer	2010
2	Srinivasan Desikan, Gopalaswamy Ramesh	Software Testing Principles and Practices	Pearson Education	2012
3	Navneesh Garg	Test Automation Using Selenium WebDriver with Java	AdactIn Group Pvt Ltd	2014

Reference Books

S. No	Author	Title of the Book	Publishers	Year of Publication
1	RenuRajani	Testing Practitioner Handbook	Packt Publishing Limited	2017
2	NareshChauhan	Software Testing	Oxford University Press	2 nd Edition, 2016

3	Adithya Garg, Ashish Mishra	A Practitioner's Guide to Test Automation Using Selenium	Tata McGraw Hill Education	2015
4	SatyaAvasarala	Selenium Web Driver Practical Guide	Packt Publishing	2014

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies.

Course Designer

- Mrs. S. Ponmalar

Web References

- <http://seleniumhq.org/>
- <http://sourceforge.net/projects/sahi/>
- <http://testng.org/doc/index.html>

Course Number	Course Name	Category	L	T	P	Credit
CG21C11	Introduction to Digital Technology	Theory	58	2	-	3

Preamble

This course provides an insight on robotic process automation, concepts, workflows, and automation tools. It emphasizes automation tool UiPath activities, workflows in bot development.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall robotic process automation basics, tools, UiPath basic constructs in bot development	K1
CLO2	Understand the need of automation, UiPath sequence, activities and applications	K2
CLO3	Apply various robotic process automation workflows for bot development	K3
CLO4	Analyse the need of robotic process automation and automate real world business processes	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	M	S
CLO3	S	S	S	S	S
CLO4	S	S	S	M	S

S-Strong; M-Medium; L-Low.

Introduction to Digital Technology - CG21C11

(58Hrs)

Syllabus

Unit I

12Hrs

RPA Foundations: **RPA** -History of RPA- **Benefits of RPA**- Downsides of RPA-RPA Compared to BPO, BPM, and BPA - Consumer Willingness for Automation-The Workforce of the Future-RPA vendors - **UiPath** - Automation Anywhere - Blue Prism Tool - **Comparison of RPA Tools**.

Unit II

12 Hrs

RPA Skills: On-Premises Vs. the Cloud-Web Technology-Programming Languages and Low Code-OCR (**Optical Character Recognition**)-Databases-**APIs (Application Programming Interfaces)**-AI (**Artificial Intelligence**)-Cognitive Automation-Agile, Scrum, Kanban, and

Waterfall-DevOps-Flowcharts. RPA Planning: The Preliminaries - Use a Consulting Firm -RPA Consulting - Case Studies - Automation - ROI for RPA - **RPA Use Cases** - RPA Plan.

Unit III

12 Hrs

Bot Development–Preliminaries-**Installation of UiPath - Getting Started-Activities - Flowcharts and Sequences** - Log Message -Variables - Loops and Conditionals - For Each Loop - Do While Loop and While Loop-IF/THEN/ELSE Conditionals -Switch-Debug-Common UiPath Functions-**The UiPath Orchestrator**-Best Practices for Bot Development.

Unit IV

11 Hrs

Email Automation - Move e-mails to another folder-Mark e-mail as read or unread - Save attachments and e-mails. **Word Automation** - Save document as a different file-Read text from a document- **Export a word document as pdf.**

Unit V

11 Hrs

Excel automation: Write values into cells - Read values from cells- **Save an excel file indifferent formats (Pdfs, CSV)** File Automation: File create, delete, move folders - Create, delete copy and move files, Check if a folder already exists- **Check if a file already exists.**

Text Books

S.No	Author	Title of the Book	Publishers	Year of Publication
1	Tom Taulli	The Robotic Process Automation Handbook-A Guide to Implementing RPA Systems	Apress	2020
2	AdeelJaved, AnumSundrani, Nadia Malik, Sidney Madison Prescott	Robotic Process Automation using UiPath StudioX: A Citizen Developer’s Guide to Hyperautomation	Apress	2021

Reference Books

S.No	Author	Title of the Book	Publishers	Year of Publication
1	S. Mukherjee	Essentials of Robotics ProcessAutomation	Khanna Publishing House	2019
2	NandanMullakara and Arun Kumar Asokan	Robotic Process Automation Projects	Packt Publishing	2020
3	Dr. Jisu Elsa Jacob andManjunath N	Robotics Simplified	BPB Publications	2022

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies.

Course Designer

- Dr. S. Karpagavalli

Course Number	Course Name	Category	L	T	P	Credit
CG21C12	Client Relationship Management	Theory	58	2	-	3

Preamble

The course provides an insight on IT Service Management (ITSM), ITIL guidelines, ServiceNow to automate business management. It enables to perform basic and advanced administration using ServiceNow workflow automation platform to improve operational efficiencies in enterprise.

Course Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall ITSM, ITIL, ServiceNow basics, scripting, UI policies and business rules	K1
CLO2	Understand basic and system administration using ServiceNow	K2
CLO3	Apply ServiceNow APIs for problem, incident, change and service request management	K3
CLO4	Analyze SLAs and business rules to streamline and automate routine work tasks using ServiceNow	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	M
CLO2	S	S	S	S	S
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S

S-Strong; M-Medium; L-Low

Client Relationship Management- CG21C12

(58Hrs)

Syllabus

Unit I

12 Hrs

Service Now Intermediate level / Administrator - ServiceNow Introduction - ServiceNow Platform UI **ServiceNow ITSM overview**-Managing Users, Groups and Roles, departments, companies - Impersonate user - Tables, Columns, Attributes, Dictionary Entries, **Schema Map-Managing Forms, Layouts and Lists**-Dictionary Overrides.

Unit II

12 Hrs

System Properties - Incident management - Assignment Rules- Problem management-Change management - Managing Update Sets- **Overview of other ITSM Modules** - SLA Basics- UI

Policies and Data Policies. Introduction to Server-Side Scripting: **Server-side scripting**- Server-Side Glide API -Server-Side script Debugging - Server-Side Scripting Best Practices - Business Rules.

Unit III

12Hrs

Introduction to Client-Side Scripting: Client - **Side APIs** - **Client Scripts** - Client-Side script Debugging - **Client Glide API** -Best Practices - client-side scripting & UI and Data policies - Modularize programming using UI Actions (both Server and Client Side) - Script Include - **Simple Reference Qualifiers** - **Glide AJAX**-UI Pages - Custom Applications Automated Test Framework - Events-Inbound/Out Bound Notifications-Mail Templates.

Unit IV

11 Hrs

Manage Workflows- Managing Stage Sets -Manage Workflows -**Flow Designer overview**-Service Catalogs, Categories, Items and variables - **Manage Execution Plans and workflows**-Catalogue UI policies - Order Guides - Record Producers- Scheduled Jobs - Configure and run Reports and Dashboards Security Controls-Database Views. **VTB Agent Intelligence overview** - Restrict access to applications and application modules-Automatically create application Access Controls -Manually create, test, and debug Access Controls-**Managing ServiceNow imports and exports**-Managing Import Sets and Transform Map.

Unit V

11 Hrs

ServiceNow Service portals overview - ServiceNow Service portals core components - ITSM Virtual Agent - Overview -**Performance Analytics Overview**-**Service now on Mobile** - Service now Integration Overview.

Text Books

S.No	Author	Title of the Book	Publishers	Year of Publication
1	Tim Woodruff	Learning ServiceNow: Administration and development on the Now platform, for powerful IT automation	Packt Publishing Ltd	2 nd Edition, 2018
2	Ashish Rudra Srivastava	ServiceNow Cook Book	Packt Publishing Ltd	2017

Reference Books

S.No	Author	Title of the Book	Publishers	Year of Publication
1	Andrew Kindred	Mastering ServiceNow Scripting	Packt Publishing Ltd	2 nd Edition, 2018
2	Tim Woodruff Ashish Rudra Srivastava Martin Wood	ServiceNow: Building Powerful Workflows	Packt Publishing Ltd	2017

Web references

- <https://docs.servicenow.com/>

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies.

Course Designer

- Mrs. M. Sowmya

Course Number	Course Name	Category	L	T	P	Credit
CG21E01	Data Mining	Theory	73	2	-	5

Preamble

This course covers the basic concepts of data mining principles and methods. It provides insight on classification, and clustering techniques and focuses on applications like web mining, text mining and biological data mining.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the basic concepts of data mining	K1
CLO2	Understand the techniques and algorithms of data mining	K2
CLO3	Apply classification, prediction, clustering algorithms for simple data mining task	K2
CLO4	Analyze the role of data mining algorithms to solve real world problems	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	M
CLO2	S	M	S	S	M
CLO3	M	M	S	M	M
CLO4	S	S	M	S	S

S-Strong; M-Medium; L-Low

Data Mining - CG21E01

(73Hrs)

Syllabus

Unit I

15Hrs

Introduction: Data Mining - KDD vs Data mining-DBMS vs Data Mining-Other areas-Data mining techniques-Issues and challenges-Application areas.

Unit II

15 Hrs

Association Rule: Introduction-Methods in association rule - Apriori algorithm. Clustering: Introduction- Clustering paradigms-Partition algorithm-K-medoid algorithms-CLARA- CLARANS - Hierarchical clustering - DBSCAN -BRICH-CURE.

Unit III

15Hrs

Decision Tree: Introduction-Tree construction principles-Best split-splitting indices- splitting criteria-Tree construction algorithms: CART-ID3-C4.5-CHAID.

Unit IV**14 Hrs**

Other Techniques: Introduction - Neural Networks-Learning in NN-Unsupervised Learning-Genetic algorithm-Support Vector Machine.

Unit V**14 Hrs**

Web Mining: Introduction-Web mining-Content mining- Structure mining-Usage mining- Text mining - unstructured text-Episode rule discovery for texts-Hierarchy of categories-Text clustering. Temporal and Spatial Mining: Introduction - Temporal Association rules - Sequence Mining - Spatial Mining - Spatial Mining Tasks - Spatial Clustering.

Text Book

S.No	Author	Title of the Book	Publisher	Year of Publication
1	Arun K Pujari	Data Mining Techniques	University Press	3 rd Edition, 2013

Reference Books

S.No	Author	Title of the Book	Publisher	Year of Publication
1	PangNingTan, Michael Steinbach and VipinKumar.	Introduction to Data Mining	Pearson Education	2016
2	Max Barmer	Principles of Data Mining	Springer	3 rd Edition, 2016
3	Herbert Jones	Data Mining	Bravex Publications	2020

Pedagogy

- Lectures, Demonstration, Case studies

Course Designer

- Mrs. D. Suganthi

Course Number	Course Name	Category	L	T	P	Credit
CS21E02	Big Data Analytics	Theory	73	2	-	5

Preamble

The course provides an introduction to big data analytics, tools and techniques. It introduces Hadoop architecture and map reduce programming model. It also provides knowledge on No SQL databases, querying model and applications in big data.

Course Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the basics of big data, tools and techniques in big data analytics	K1
CLO2	Understand the programming models, data storage and querying models and data visualization in big data analytics	K2
CLO3	Apply the big data analytics methods and tools for solving real-world problems	K3
CLO4	Analyze the specific business case and apply appropriate data analytic tools and methods	K4

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	M	S	S
CLO3	S	S	S	S	S
CLO4	S	M	S	S	S

S-Strong; M-Medium; L-Low

Big data analytics - CS21E02 (73 Hrs)

Syllabus

Unit I

15Hrs

Overview of Big Data: Defining Big Data - Big Data Types - Big Data Analytics - Industry Examples of Big Data - Big Data and Data Risk - Big Data Technologies - Benefits of Big Data - Basics of Hadoop: BigData and Hadoop - Hadoop Architecture - Main Components of Hadoop Framework – Analysing BigData with Hadoop - Benefits of Distributed Applications - Hadoop Distributed File System - Advantages of Hadoop - Ten Big Hadoop Platforms

Unit II**15 Hrs**

Hadoop Distributed File System: Architecture of APACHE Hadoop HDFS - File Systems - HDFS File Blocks - HDFS File Commands. Map Reduce: Introduction to Map Reduce - Working of Map Reduce - Map operations -Map Reduce Program - Map Reduce User Interfaces.

Unit III**15Hrs**

NoSQL Databases: NoSQL Data Management - Types of NoSQL Databases - Query Model for Big Data - Benefits of NoSQL. HBase, CASSENDRA and JAQL: Introduction to HBase - Row-oriented and Column-oriented Data Stores - HDFS Vs HBase - HBase Architecture - HBase Data Model - Understanding HBase Data Model - Introduction to Cassandra - Features - Data Replication - Components - Cassandra Query Language - Data Model - Data models of Cassandra and RDBMS. Introduction to JAQL - JSON - Components of JAQL.

Unit IV**14 Hrs**

HIVE: Introduction to Hive - Data Models – Building Blocks - Data file formats - Hive for Data warehousing - HiveQL - Data Manipulation - Queries - Hive - Built in Functions. PIG: Introduction - Components - PIG Program Execution Modes - Data formats and Models - Pig vs SQL - Pig Vs Map Reduce - Difference between Hive and Pig - Apache Pig history.

Unit V**14 Hrs**

Data Visualization Tools: Tableau - Advantages - Creating Visualization - Text Table - Heat Maps - Maps with calculated Colours - Creating Maps - Dashboard. Applications:WALMART: How Big Data is used to Drive Supermarket Performance - NETFLIX: How Netflix Used Big Data to Give Us the Programmes We Want - FACEBOOK: How Facebook Use Big Data to Understand Customers.

Text Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	V.K. Jain	Big Data and Hadoop	Khanna Book Publishing	2017
2	Chandraish Sinha	Tableau 10 for Beginners	Createspace Independent Pub	2018
3	Bernard Marr	Big Data inPractice	Wiley Publications	2016

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	G. SudhaSadasivam and R. Thirumahal	Big Data Analytics	Oxford University Press	2020
2	ArshdeepBahga and Vijay Madiseti	Big Data Analytics: A Hands-On Approach	VPT	2018
3	Paul Zikopoulos and Chris Eaton	Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data	Tata McGraw Hill	2011

Pedagogy

- Lectures, Demonstration, Case studies

Course Designer

- Dr. N. Baggyalakshmi

Course Number	Course Name	Category	L	T	P	Credit
CG21E03	Computer Graphics	Theory	73	2	-	5

Preamble

This course covers the computer graphics display devices. It covers the drawing, clipping algorithms, 2D and 3D transformations. It focuses on interactive input methods and functions in computer graphics.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the graphics techniques used in various applications and display devices	K1
CLO2	Understand the concept of drawing algorithms, rotation&transformation, clippings and transformations	K2
CLO3	Apply Computer graphic algorithms to solve problems	K3
CLO4	Illustrate the steps to perform 2D & 3D graphic representation in applications	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	S	S	S
CLO3	S	M	S	S	S
CLO4	S	S	S	S	S

S-Strong; M-Medium; L-Low

Computer Graphics - CG21E03

(73 Hrs)

Syllabus

Unit I

14 Hrs

Basic Concepts: Uses of computer graphics - Display devices - Color CRT monitors - Direct view storage tube - Flat panel displays - Raster scan systems - Random scan system, Input and Hard copy device.

Unit II

15Hrs

Line drawing algorithms: DDA algorithm - Bresenham's line drawing algorithm - Parallel line algorithms - Circle generating algorithms: Properties of circles, Midpoint circle algorithm.

Unit III**15Hrs**

Two dimensional transformations: Basic transformations - Composite transformation of translation, Rotation, Scaling - General Pivot point rotation - General fixed point scaling - Other transformations: Reflection, Shear. Two dimensional viewing: Clipping Operations - Point clipping - Line clipping: Cohen Sutherland line clipping - Curve clipping - Text clipping - Exterior clipping.

Unit IV**14 Hrs**

Graphical User Interface and Interactive Input methods: Input of graphical Data: Logical input devices - Locator Devices - Stroke Devices - String Devices - Valuator Devices - Choice Devices - Pick Devices - Input Functions: Input Modes - Request Modes - Locator and Stroke Input Request Modes, String Modes - Valuator Modes - Choice Modes - Pick Modes - Sample Modes - Event Modes.

Unit V**15 Hrs**

Three dimensional concepts: Three dimensional display methods - Three dimensional geometric and Modeling Transformations: Translation, Rotation and Scaling - Three Dimensional Viewing: Viewing Pipeline - Viewing Coordinates - Projections. Visible Surface Detection Methods: Back Face Detection Method - Depth Buffer Method - Octree Method. Surface Rendering Methods: Polygon Rendering Methods.

Text Book

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Donald Hearn M. Pauline & Baker	Computer Graphics - C Version	Pearson Education Publication	2 nd Edition, 2008

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Udit Agarwal	Computer Graphics	S K Kataria & Sons	2013
2	Pradeep K. Bhatia	Computer Graphics	IK International Publishing House	3 rd Edition, 2013
3	John F Hughes et.al.,	Computer Graphics: Principles and Practice	Addison Wesley	3 rd Edition, 2013

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designer

- Dr. S. Karpagavalli

Course Number	Course Name	Category	L	T	P	Credit
CG21CP9	Digital Technology Lab	Practical	-	-	60	3

Preamble

This course provides hands-on training in UiPath automation tool. It enables the students to automate the real-world business processes using UiPath.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand UiPath basic constructs in bot development	K2
CLO2	Apply UiPath data types, sequence, activities in automation	K3
CLO3	Illustrate UiPath in real world workflow automation	K3
CLO4	Demonstrate the steps to automate real world business processes	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium; L-Low.

Digital Technology Lab - CG21CP9

(60 Hrs)

List of Exercises

Create a bot for the following processes:

- Check whether the number given by the user is even or odd
- Basic and Desktop Recording
- Notepad Automation
- Word Automation
- Web scrapping
- Google form filling automation
- E-mail Automation
- Files Automation
- Excel Automation
- PDF Automation

- Write a program to i) empty the trash folder in Gmail ii) empty the Recycle Bin
- Excel to Web Automation
- Certificate Automation
- Website Login Automation
- UiPath Orchestrator

Pedagogy

- Demonstration of working environment / Tools / Software / Programs

Course Designer

- Dr. S. Karpagavalli

Course Number	Course Name	Category	L	T	P	Credit
CG21CP10	Client Relationship Management Lab	Practical	-	-	60	3

Preamble

This course provides hands-on training on ServiceNow software platform which helps to automate IT business management. It enables the students to understand, build, and deploy applications on the ServiceNow platform for managing various IT services.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand ServiceNow cloud-based software platform and features	K2
CLO2	Apply ServiceNow to manage different IT services thru client and server scripting, policies, tickets and SLAs	K3
CLO3	Illustrate steps to write, test, and debug client scripts, UI policies and business rules	K3
CLO4	Demonstrate the steps to automate basic and advanced administration using ServiceNow	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	S	M
CLO3	S	S	S	S	S
CLO4	S	S	M	S	S

S-Strong; M-Medium; L-Low.

Client Relationship Management Lab - CG21CP10 (60 Hrs)

List of Exercises

- Creating user, group and roles
- Assignment rule
- Service level agreement
- Applying business rule
- Client scripting
- Mail template and Inbound/outbound mail
- Create workflow
- Create flow designer

- Create a service catalog
- Create an order guide
- Create a record producer
- Create application and table using ACL
- Create scheduled reports
- Import sets to add users to group table.

Pedagogy

- Demonstration of working environment / Tools / Software / Programs

Course Designer

- Mrs. M. Sowmya

Course Number	Course Name	Category	L	T	P	Credit
CG20SBCE	Coursera - Software Testing Tools	Theory	-	-	-	3

Course Contents

(59 Hrs)

- Introduction to Software Testing (30 Hrs)
- Overview of JUnit Testing (7hrs)
- Mocking with Junit (7hrs)
- Java Testing: An Introduction to TDD (7hrs)
- Parameterized and Dynamic Testing in Junit (8hrs)

Course Number	Course Name	Category	L	T	P	Credit
NM21CS1	Cyber Security 1	Theory	30	-	-	Grade

Objective

This course introduces fundamental concepts of Cyber Security in the digital era. It provides the knowledge of cybercrimes, cyber laws and also the security of digital devices. It helps to do secure digital transactions and safe usage of social media.

Cyber Security - NM21CS1

(30 Hrs)

Syllabus

Unit I

6 Hrs

Principles of Cyber security: Introduction to Cyber security - Defining cyberspace - Architecture of cyberspace - Communication and web technology - Internet infrastructure for data transfer and governance - Regulation of cyberspace - Concept of Cyber security - Issue and challenges of cyber security.

Unit II

6 Hrs

Cyber Crime: Introduction to Cybercrime - Classification of Cyber-crimes – Cyber-crime against women and children – Financial frauds - Social engineering attacks – Malware - Zero day and zero click attacks.

Unit III

6 Hrs

Cyber Law: Cyber Criminals modus-operandi – Reporting of cybercrimes – remedial and mitigation measures – Legal perspective of cybercrime– IT Act 2000 and its amendments – Organization dealing with cybercrimes and cyber security in India.

Unit IV

6 Hrs

Social Media Security: Introduction to social network – Types of social media – Social media platform – Hashtag – Viral content – Security issues related to social media. – **Cyber Security tools:** Nmap – Introduction to Nmap – Nmap scan types- Nmap command list.

Digital Transaction: Introduction to digital payments – Components of digital payments – Modes of digital payments – Banking cards – UPI (Unified Payment Interface) – e-Wallets.

Unit V

6 Hrs

Digital Devices Security: End point device and Mobile phone security – Password policy – Security patch management – Data backup – Device security policy – Cyber security best practices. Installation and configuration of Computer Anti-Virus.

Case studies: Illustrations of Financial frauds – Digital Signature. Prepare a checklist for secure net banking

*e-Content will be provided

*This course is for all final year students of all streams from 2023-24 year onwards.

Reference books:

1. Raef Meeuwisse, Cybersecurity for Beginners, Lulu Publishing Services, 2nd Edition, 2017
2. Scott Augenbaum, The Secret to Cybersecurity-A Simple Plan to Protect Your Family and Business from Cybercrime, Forefront Books Publisher, 2019
3. Sunit Belapure and Nina Godbole, Cyber security understanding cybercrimes computer forensics and Legal perspectives, Wiley India Pvt Ltd, 2011
4. Christopher Hadnagy, Social Engineering: The Science of Human Hacking, Wiley Publisher, 2nd Edition, 2018
5. Pavan Duggal, Artificial Intelligence, Cybercrimes & Cyberlaw, 2018
6. Joe Gray, Practical Social Engineering: A Primer for the Ethical Hacker, 2022
7. Henry A. Oliver, Security in the digital age: social media security threats and vulnerabilities, Create Space Independent publishing platform, 2015.

Evaluation Pattern

Quiz	60 Marks
Case Study	20 Marks
Poster	20 Marks
Total	100 marks

Course Number	Course Name	Category	L	T	P	Credit
CG20AC1	Multimedia and its Applications	Theory	Self-Study			5

Preamble

This course provides basic concepts in multimedia and devices, systems, tools and techniques. It also focuses on animation, distributing multimedia in networks, art, design and digital cinematography.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the basic components of multimedia systems and techniques in handling multimedia	K1
CLO2	Understand the tools, devices, animation, streaming multimedia and digital media	K2
CLO3	Apply various multimedia techniques in solving problems	K3
CLO4	Demonstrate the steps in handling multimedia data, sharing data, animation and motion picture	K4

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	S	M
CLO3	S	S	S	S	S
CLO4	S	S	M	S	S

S- Strong; M-Medium; L-Low.

Multimedia and its Applications -CG20AC1

Syllabus

Unit I

Multimedia Introduction: Definitions - Classifications of Multimedia -History of Multimedia- Multimedia Objects- Multimedia hardware: Digital Audio and Video hardware- Memory & Storage devices- Communication devices-Software Executable and Library -Applications of multimedia.

Unit II

Multimedia Tools: Presentation tools- Image Capturing- Authoring tools-Card and Page based authoring tools- Perception of Sound- Hearing sensitivity- Frequency range - Sound- Wave length- The speed of sound-Measuring the sound- Musical sounds- Noise signal- Dynamic range-

Microphones types -Phantom power- Choosing the right mike- Mixing console- Input devices- Output devices- Audio Publishing.

Unit III

Text and Sound in Multimedia application: Labels & Captions - Informational text-Navigation and user support-Application of text to multimedia project -Hypertext: Indexed retrieval systems-Multimedia Audio: Digital medium - Digital audio technology - Sound cards - Recording - Editing - MP3 - MIDI fundamentals - Working with MIDI - Audio file formats - Adding sound to Multimedia project.

Unit IV

Multimedia Animation: Computer animation fundamentals - Kinematics - Morphing - Animation Software tools and techniques -Creating animations-Object based animation-Multimedia Video: How video works - Broadcast video standards - Digital video fundamentals -Digital video production and editing techniques - File formats.

Unit V

Multimedia Project: Stages of project - Multimedia skills - Design concept - Authoring - Planning and Costing - Multimedia Team-Multimedia looking towards Future: Digital Communication and New Media - Interactive Television- Digital Broadcasting - Digital Radio- Multimedia Conferencing - Contemporary issues:Emerging Fields in Multimedia Technology - Industry Expert Talk.

Text Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	David Hillman	Multimedia Technology and Applications	Galgotia Publications pvt. Ltd	2015
2	Tay Vaughan	Multimedia making it work	Tata Mc-GrawHill Publications	2017

Reference books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Kiran Thakrar, Prabhat .K. Andleigh	Multimedia System Design	Prentice Hall India	2015
2	Malay k Pakhira	Computer graphics, Multimedia and Animation	Prentice Hall India.	2 nd Edition, 2010

Course Designer

- Mrs. J. Mythili

Course Number	Course Name	Category	L	T	P	Credit
CG20AC2	Information Management Systems	Theory	Self Study			5

Preamble

This course covers the basics of management information system to understand the operations of an industry. It also covers strategic management decision making applications in sectors and ERP.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the operations of a firm and different management activities, IT Systems	K2
CLO2	Understand strategy, decision making, MIS applications in different sectors and ERP	K3
CLO3	Apply MIS in various application sector	K3
CLO4	Analyze the management operations, strategy and to apply MIS tools	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	S	M
CLO3	S	S	S	S	S
CLO4	S	S	M	S	S

S- Strong; M-Medium; L-Low.

Information Management Systems - CG20AC2

Syllabus

Unit I

Introduction to MIS: MIS concept - Definition - Role of MIS - Impact of MIS - MIS and the User - Management as a Control system - MIS: a support to Management - Management Effectiveness and MIS - Organization as a system - Organizational Behaviours. Process Management: Planning - Organizing - Staffing - Coordinating - Directing and Controlling.

Unit II

Strategic Management of Business Performance: Essentiality of Strategic Planning - Tools of Planning - Strategic Management of Business Performance - Strategy - Class and Types of Strategies. Electronic Business Technology: Introduction to E-Business - Models of E-Business- Electronic Payment System - Security in E-Business - MIS and E-Business. A tool for business management: Internet and Web Process Management - Strategic Management under Web - Web

Enabled Business Management - Application system Architecture in Web - MIS in Web Environment.

Unit III

Decision Making: Decision-making concepts - Decision-making process - Behavioural Concepts in Decision-making - Organizational Decision-making - MIS and Decision-making - Decision Methods Tools and Procedures. Information and Knowledge: Information Concepts -Information: a quality product - Classification of Information - Methods of data and Information Collection - Value of Information - General Model of a Human as an Information Processor. Choice of Information Technology: Nature of IT decision - Strategic Decision - Configuration Design - Evaluation.

Unit IV

Applications in Manufacturing Sector: Personnel, financial, production, raw material and Marketing Managements. Applications in Service Sector: Introduction to Service Sector -Creating a distinctive service - MIS Application in Service Industry - MIS: Service Industry.

Unit V

Enterprise: Enterprise Management Systems - ERP system - ERP Model and Modules - Benefits of ERP - ERP Product Evolution - ERP Implementation - EMS and MIS. Technology of Information Systems: Introduction - Data Processing - Transaction Processing - Application Processing - Information System processing - Human Factors and User Interface -Real Time Systems and Good Design.

Text Book

S.No	Author	Title of Book	Publisher	Year of Publication
1	Waman S Jawadekar	Management Information Systems	Tata McGraw Hill Publications	5 th Edition, 2013

Reference Books

S.No	Author	Title of Book	Publisher	Year of Publication
1	James A O'Brien & George M Marakas	Management Information Systems	Tata McGraw Hill Publications	7 th Edition, 2007
2	Kenneth C Laudon & Jane P Laudon	Management Information Systems: Managing the Digital Firm	PHI Publications	12 th Edition, 2011
3	Mahadeo Jaiswal & Monika Mital	Management Information Systems	Oxford Publications	2004

Course Designer

- Mrs. P. Parvathi