DEPARTMENT OF INFORMATION TECHNOLOGY

CHOICE BASED CREDIT SYSTEM
&
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (LOCF)

BACHELOR OF INFORMATION TECHNOLOGY

2024-2027 BATCH

PROGRAMME LEARNING OUTCOMES (PLO's)

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

PLO1: Design, implement, and evaluate a computing-based solution to meet the industry standards.

PLO2: Apply computing theory and programming principles to real-time software design and development.

PLO3: Explore Current and emerging techniques and technologies to formulate solutions for systems and organizations.

PLO4: Pursue higher studies in the specialized area and also promote life-long learning for professional development.

PLO5: Recognize as world class professionals in IT and produce women entrepreneurs to increasemore employability.

PROGRAMME SPECIFIC OUTCOMES (PSO's)

The students at the time of graduation will

PSO1: Professionally be equipped in the areas of programming, Cloud Infrastructure, Internet of Things, Mobile Application Development and to be ease with the recent technologies of various domains.

PSO2: Apply the knowledge of technology and soft skills to carry out societal software development.

PSO3: Analyze modern computer languages and applications for their successful Career, to create platforms to become an entrepreneur and a relish for higher studies.

PSGR
Krishnammal College for Women

Affiliated to Bharathiar University \ Autonomous \ College of Excellence \ Accredited with A++ Grade \ Ranked 9th in NIRF

Department of Information Technology

Choice Based Credit System & Learning Outcomes Based Curriculum Framework

Bachelor of Information Technology - 2024 -2027 Batch & Onwards

Semester	Part	Subject Code	Title of Paper	Category	Instruction Hours / Week	Contact Hours	Tutorial Hours	Duration of Examination	Examination Marks			
									CA	ESE	Total	Credits
I	I	TAM2401A/ HIN2401A/ FRE2401A	Language I- Tamil Paper I / Hindi Paper I/ French Paper I	L	4	58	2	3	25	75	100	3
I	II	ENG2401A	English Paper I	E	4	58	2	3	25	75	100	3
I	III	CY24C01	**Core 1**: Programming in C	CC	4	58	2	3	25	75	100	3
I	III	PP22C02	**Core 2**: Computational and Algorithmic Thinking for Problem Solving	CC	3	45	-	-	100	-	100	3
I	III	AP24C03	**Core 3:** 24	CC	4	58	2	3	25	75	100	3
I	III	TH24A03	**Allied A1**:Numerical and Statistical Techniques	GE	6	88	2	3	25	75	100	5
I	III	IN24CP1	**Lab1:** Programming in C lab	CC	3	45	-	3	15*	35*	50	2
	Non Tamil Students											
I	IV	NME23B1 / NME23A1	Basic Tamil I / Advance Tamil I	AEC	2	28	2	-	100	-	100	2
Students with Tamil as Language												
I	IV	NME23ES	Introduction to Entrepreneurship	AEC	2	30	-	-	100	-	100	

I -V	V I	24BONL1 24BONL2 24BONL3	Online Course-I Online Course- II Online Course-IIII	ACC	-	-	-	-	-	-	-	
I	IV		Job Oriented Course: Amazon Web Services/Cisco Certified network Associate/Micr os oft Windows Server Administration/M icro soft Power BI	-	-	-	-	-	-	-	-	-
II	I	TAM2302A/ HIN2302A/ FRE2302A	Tamil Paper II/ Hindi Paper II/ French Paper II	L	4	58	2	3	25	75	100	3
II	II	ENG2302A	English Paper II	E	4	58	2	3	25	75	100	3
II	III	IN24C04	Python Programming	CC	5	73	2	3	25	75	100	3
II	III	IN23C05	Data Structure and Algorithm	CC	4	58	2	3	25	75	100	3
II	III	IN24CP2	Python Programming Lab	CC	5	75	-	3	15#	35#	50#	2
II	III	TH24A11	Discrete Mathematics	GE	6	88	2	3	25	75	100	5
II	IV	NM24UHR	Universal Human Values and Human Rights	AECC	2	30	-	-	100	-	100	2
II	IV	NME23A2*/ NME23B2	Advanced Tamil/Basic Tamil	AEC	-	-	-	-	100	-	100	Gr.

I-II	VI	NM23GAW	General Awareness	**AEC**	SS	-	-	-	100	-	100	Gr.
I-IV	VI	COM15SER	Community Services (30 Hours)	**GC**	-	-	-	-	-	-	-	-
I-V	VI	24BONL1 24BONL2 24BONL3	Online Course- I Online Course -II Online Course -III	**ACC**	-	-	-	-	-	-	-	-
III	**I**	TAM2303A/ HIN2303A/ FRE2303A	Tamil Paper III/ Hindi Paper III/ French Paper III	**L**	4	58	2	3	25	75	100	3
III	**II**	ENG2403A	English Paper III	**E**	4	58	2	3	25	75	100	3
III	**III**	IN23C06	Database Management System	**CC**	4	58	2	3	25	75	100	3
III	**III**	IN23C07	Digital Logic and circuits	**CC**	4	58	2	3	25	75	100	3
III	**III**	CS23SBGP	Gen-AI	**SEC**	3	44	1	-	100	-	100	3
III	**III**	TH24A20	Optimization Techniques	**GE**	4	58	2	3	25	75	100	3
IIII	**III**	IN23CP3	DBMS lab	**CC**	5	75	-	3	15*	35*	50	3
III	**IV**	NM23DTG	Design Thinking	**AEC**	2	30	-	-	100	-	100	2
I-III	**VI**	COM15SER	Community Services 30 Hours	**GC**	-	-	-	-	-	-	-	-
I-V	**VI**	24BONL1 24BONL2 24BONL3	Online Course I Online Course II Online Course II	**ACC**	-	-	-	-	-	-	-	-
IV	**I**	TAM2304A/ HIN2304A/ FRE2304A	Tamil Paper IV/ Hindi Paper IV/ French Paper IV	**L**	4	58	2	3	25	75	100	3

IV	II	ENG2404A	English Paper IV	**E**	4	58	2	3	25	75	100	3
IV	III	IN23C08	Computer Networks	**CC**	4	58	2	3	25	75	100	3
IV	III	IN24C09	Oops with Java	**CC**	4	58	2	3	25	75	100	3
IV	III	IN24CP4	Oops Programming Lab	**CC**	5	75	-	3	15*	35*	50	2
IV	**iii**	AP23A01 CS23A02	Digital Marketing M-Commerce	**GE**	4	58	2	3	25	75	100	3
IV	**III**	IN23EII	Entrepreneurship and Innovation(IgniteX)	**AECC**	2	30	-	-	100	-	100	2
IV	IV	NM24EVS	Environmental Studies	AECC	SS	-	-	-	100	-	100	Gr.
IV	V	COCOACT	Co-Curricular Activities	GC	-	-	-	-	100	-	100	1
I-V	VI	24BONL1 24BONL2 24BONL3	Online Course I Online Course II Online Course III	**ACC**	-	-	-	-	-	-	-	-

*CA conducted for 25 and converted in to 15, ESE conducted for 75 and converted in to 35

CC: Core Courses CA: Continuous Assessment

GE: Generic Elective ESE : End Semester Examination

AEC: Ability Enhancing Course SEC: Skill Enhancement Course

AECC : Ability Enhancement Compulsory Course L:Language, E: English

ACC: Additional Credit Course

GC: General Course
Gr: Grade

CY24C01- PROGRAMMING IN C

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

PP22C02- COMPUTATIONAL AND ALGORITHMIC THINKING FOR PROBLEM SOLVING

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

IN22CP1-PROGRAMMING IN C LAB

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

AP24C03-OPERATING SYSTEMS FUNDAMENTALS - LINUX

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

PYTHON PROGRAMMING-IN24C04

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	M	S

CLO2	S	S	M	S	M
CLO3	M	S	S	S	S
CLO4	S	M	S	S	S

DATA STRUCTURE AND ALGORITHM-IN23C05

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

PYTHON PROGRAMMING LAB-IN24CP4

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

DATABASE MANAGEMENT SYSTEMS – IN23C06

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

DIGITAL LOGIC AND CIRCUITS - IN23C07

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

Gen-AI –CS23SBGP

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

DBMS LAB - IN23CP3

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	M	S	S	M
CO2	S	M	S	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

COMPUTER NETWORKS –IN23C08

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

OOPs WITH JAVA-IN24C09

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

OOPs PROGRAMMING LAB-IN24CP4

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

DIGITAL MARKETING-AP23A01

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

M-COMMERCE-CS23A02

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	S	S	M	S

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
CY24C01	PROGRAMMING IN C	Theory	58	2	-	3

Preamble

This course introduces fundamental programming constructs in C. It covers the concepts such as arrays, functions, structures, pointers and file handling. 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	Recall the programming constructs and structure of C programming and Industry 4.0 technologies	K1
CLO2	Understand the purpose of arrays, strings, structures, pointers and files to solve problems	K2
CLO3	Apply functions to solve problems using procedure oriented approach	K3
CLO4	Analyze the problems and solve it by applying appropriate logic	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	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;

PROGRAMMING IN C – CY24C01 58 Hrs

Syllabus

Unit I **12 Hrs**

Overview of C - Constants, Variables and Data types - Operators and Expressions - Managing Input and Output Operations - **Decision Making and Branching - Decision Making and Looping.**

Unit II **11 Hrs**

Arrays: One-Dimensional - Two Dimensional - Multidimensional Arrays. Character Arrays and Strings: Declaring and Initializing String Variables - Reading Strings from Terminal - Writing Strings to Screen - String Handling Functions.

Unit III **12 Hrs**

User-Defined Functions: Need - Return Values and Types - Function Calls - Function declaration - Category of Functions - No Arguments and No Return Values - Arguments but No Return Values - Arguments with Return Values - Recursion - Scope Visibility and Life time of Variables.

Structure Definition: Structure Initialization - Comparison of Structure Variables - Arrays of

Structures - Arrays within Structures.

Unit IV **12 Hrs**

Pointers: Understanding Pointers - Accessing the Address of a Variable - Declaring and Initializing Pointers - Accessing a Variable through its Pointers - **Pointers and Arrays - Pointers and Character Strings** - Pointers and Functions.

File Management in C: Defining and Opening a File - Closing File **- I/O Operations on Files - Error Handling during I/O Operations** - Command Line Arguments.

Unit V **11 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 - **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 and Edition
1	E. Balagurusamy	Programming In ANSI C	Tata Mc Graw Hill	2019, 8th Edition,
2	P. Kaliraj, T. Devi	Higher Education for Industry 4.0 and Transformation to Education 5.0	CRC Press - Taylor & Francis Group	2021, 1st Edition,

Reference Books

S. No	Author	Title of the Book	Publisher	Year and Edition
1	Byron Gottfried	Programming with C	Tata McGraw Hill	2018, 4th Edition,
2	Yashwvant Kanetkar	Let Us C: Authentic Guide to C Programming Language	BPB Publications	2020, 17th Edition,

Pedagogy

- Lectures, Group discussions, Demonstrations

Course Designer

Dr. S. Beula Princy

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
PP22C02	COMPUTATIONAL AND ALGORITHMIC THINKING FOR PROBLEM SOLVING	Theory	45	-	-	3

Preamble

- *This course aims to kindle the young minds to think like a computer scientist, with the idea that Computing and computers will enable the spread of computational thinking.*
- *Computational thinking is thinking recursively, reformulating a seemingly difficult problem into one which we know how to solve and taking an approach to solving problems, designing systems, and understanding human behavior that draws on concepts fundamental to computer science.*

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Define the basic principles of logical reasoning, problem solving in computational thinking	K1
CLO2	Understanding the applications of propositional logic, problem representation and techniques	K2
CLO3	Apply algorithmic thinking to problem solving using tools	K3
CLO4	Apply and analyze to solve domain specific problems using computational thinking concepts	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;

COMPUTATIONAL AND ALGORITHMIC THINKING FOR PROBLEM SOLVING - PP22C02

45 Hrs

Syllabus

Unit I **(7 Hrs)**

Basics: Introduction to Computational Thinking- Data Logic - History of Computational Thinking- Applications of Computational Thinking.

Unit II **(8 Hrs)**

Data- Information and Data - Data Encoding - Logic - Boolean logic - Applications of simple Propositional Logic. Tool: Flowgorithm and Scratch.

Unit III **(10 Hrs)**

Problem Solving and Algorithmic Thinking: Problem definition- Logical reasoning- Problem decomposition- Abstraction- Problem representation via Algorithmic thinking: Name binding- Selection- Repetition and Control Abstraction- Simple Algorithms – Comparison of performance of Algorithms.

Unit IV **(8 Hrs)**

Activities in Class: Sudoku-Towers of Hanoi- Graph Coloring-Geographical Map reading- Poem reading-Novel reading- Data analysis on news.

Unit V **(12 Hrs)**

Problem Solving Techniques- Factoring and Recursion Techniques- Greedy Techniques-Divide and Conquer- Search and Sort Algorithms- Text Processing and Pattern matching. Tool: iPython

Text Book

S. No	Author	Title of the Book	Publisher	Year and Edition
1	David Riley and Kenny Hunt	Computational Thinking for Modern Solver	Chapman & Hall/CRC	2014,1st Edition
2	Paolo Ferragina, Fabrizio Luccio	Computational Thinking First Algorithms	Springer	2018, 1st Edition
3	Karl Beecher	Computational Thinking – A beginner's guide to problem solving	BSC publication	2017, 1st Edition

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designer
Mrs. V. Deepa

Evaluation Pattern:

Assessment	Number	Marks
Quiz (online or offline)	5	50
Class Activity	5	25
Group Project (Domain Specific)	1	25
Total		100

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN24CP1	**PROGRAMMING IN C lab**	PRACTICAL	-	-	45	2

Preamble

- *The course gives hands-on experience on C Programming and improves the practical skillset.*
- *The learner will be able to develop the logic for the given problem, recognize and understandthe syntax and construction of C code.*
- *The course involved in compiling, linking and debugging C code and developing somecomplex programs.*

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Identify the basic terminologies of C programming such as data types, conditional statement, looping statements and functions.	K1
CLO2	Develop programs with implementation of arrays, string handling functions and parameter passing techniques.	K2
CLO3	Construct programs with features of Structure and Pointers.	K3
CLO4	Develop readable programs with files for reading input and storing the output with perform operations	K4

Mapping with Programme Outcomes

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

S- Strong; M-Medium;

C PROGRAMMING LAB- IN24CP1 **45 Hrs**

Program List

- Basic Operations Statement.
- Control Structures.
- Arrays.
- Structure.
- Arrays within structure
- String handling functions.

- User defined functions.
- Pointers.
- File operations.

Pedagogy

- Demonstration of working environment/Tools/Software/Program

Course Designer

Dr.K.Sathiyakumari

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
AP24C03	OPERATING SYSTEMS FUNDAMENTALS - LINUX	THEORY	58	2	-	3

Preamble

- This subject is designed to provide the students with a thorough discussion of the fundamentals of operating system.
- To explore the various memory management scheme and to perform administrative task on LINUX servers.

Course Learning Outcomes

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

CLOs Number	CLO Statement	Knowledge Level
CLO1	Recall the basic concepts with functions of operating systems and Linux system.	K1
CLO2	Understand the operating systems objectives and functionality along with system programs and system calls.	K2
CLO3	Compare and contrast various memory management schemes.	K2
CLO4	Demonstrate deadlock, prevention and avoidance algorithms, storage management, various scheduling algorithms and shell programming.	K3

Mapping with Programme Learning Outcomes

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

S- Strong; M-Medium;

SYLLABUS

OPERATING SYSTEMS FUNDAMENTALS - LINUX –AP24C03

(58 hours)

UNIT I **(12 Hrs)**

Introduction: What is operating systems do - **Computer System Architecture** - **Operating- System Operations.** Process Management: **Process Concept** - Process Scheduling - Interprocess communication.

UNIT II **(12 Hrs)**

Process Scheduling: **Basic Concepts- Preemptive and Nonpreemptive Scheduling** - Scheduling Algorithms (FCFS, SJF & Round Robin only). Synchronization: **Back ground**-The Critical Section Problem-Peterson's Solution- Semaphores- Deadlock: **Deadlock Characterization** - Methods Handling Deadlocks - Recovery from Deadlock.

UNIT III **(11 Hrs)**

Memory Management Strategies: **Background-Contiguous Memory Allocation**-Paging. Virtual Memory Management: Demand Paging - Page Replacement - Basic Page Replacement, **FIFO Page Replacement**, Optimal Page Replacement.

UNIT IV **(11 Hrs)**

What Linux Is – Becoming a Linux Power User : About Shells and Terminal Windows- Choosing your shell - **Running Commands - Recalling Commands Using Command History** - Connecting and Expanding Commands -Using Shell Variables.

UNIT V **(12 Hrs)**

Moving Around the File system : Using Basic File system Commands - Using Meta characters and Operators -

Listing Files and Directories - Moving, Copying, and Removing Files.

Text Books

S.no	Author	Title of book	Publisher	Year and Edition
1	Abraham Silberschatz, Peter Baer Galvin, G Gagne	OPERATING SYSTEMS CONCEPTS	Wiley Publishers	2018 ,10th Edition
2	Christopher Negus	LINUX BIBLE	Wiley	2020 , 10th Edition

Reference Books

S.no	Author	Title of book	Publisher	Year and Edition
1	Archer J harries	Operating System	Tata Mc Graw Hill	2011, 2nd Edition
2	Williams E. Shotts	The Linux Command Line: A Complete Introduction	John Wiley & Sons	2019, 2nd Edition
3	Jason Cannon	Linux for Beginners	Createspace Independent Pub	2014 ,1st Edition

Pedagogy

Demonstration of working environment/Tools/Software/Program

Course Designer
Mrs. G. Rubadevi

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN24C04	PYTHON PROGRAMMING	Theory	73	2	-	3

Preamble

The course covers basic knowledge of Python Programming. It defines the Conditional Statements & Loops, Functions, Tuples, Python data structures and Exception & its tools.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the technical strengths, Python Interpreter and the program execution.	K1
CLO2	Understand the purpose of operations, strings, lists, tuples to solve problems	K2
CLO3	Apply concepts from IKS to solve problems using procedure-oriented approach	K3
CLO4	Analyze the problems and solve it by applying appropriate logic	K4

Mapping with Programme Learning Outcomes

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

S- Strong; M-Medium; L-Low

Python Programming- IN24C04 73Hrs

Syllabus

UNIT I (14 Hrs)

Introduction: Why do people use python- Python a scripting language- **Users of Python- Need of Python- Python's Technical Strengths**- How Python runs programs: Introducing the Python Interpreter- Program Execution-Execution Model Variation: Python Implementation Alternatives.

UNIT II (15 Hrs)

Types & Operations: Numbers Types: Numeric type basics, Numbers in action, Other numeric types- Strings Fundamentals: String Basics, String Literals, Strings in action, String Methods – Lists – Panini's Ashtadhyayi, Anitya – Dictionaries-Tuples and Immutable Truths-Sutras-Files.

UNIT III (15 Hrs)

Control Flow: Statements& Syntax: Assignment-Expressions & Print- if tests-While& for loops. Functions: Function Basics: Why use functions- Coding Functions- Definition & Calls. Scopes: Python basics-Global Statement-Scopes Nested functions –Arguments: Arguments

passing Basics- Special Arguments Matching Modes.

UNIT IV **(14 Hrs)**

Files and Exception handling: Files –Text Files, File Objects, **File Built-in Methods**, File Built-in Attributes, Standard Files, **Reading and writing, Format operator, Filenames and Paths**, Pipes. Exceptions: Built-in Exceptions, Handling Exceptions, Exception with Arguments- Nyaya Logic- User-defined Exceptions.

UNIT V **(15 Hrs)**

Modules and Packages: Modules – Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions. Python packages- **Simple programs using the built-in functions of packages matplotlib, numpy, pandas. GUI Programming** - Tkinter introduction, Buttons and callbacks, Canvas widgets, Coordinate sequences, Tk Widgets, Menus and Callables.

Text Book

Sno	Author	Title of the Book	Publisher	Year and Edition
1	**Mark Lutz**	Learning python(Unit I-III)	O'Reilly Publication	2013,5th edition
2	**Allen B. Downey**	Think Python: How to Think like a Computer Scientist(Unit IV-V)	O'Reilly Publishers,	2016 , 2nd Edition,
3	**Kapil Kapoor,**	Indian Knowledge Systems	Indian Institute of Advanced Study	2005,1st Edition

Reference Books

S.No	Authors	Title	Publishers	Year and Edition
1	**E. Balagurusamy**	Problem Solving and Python Programming	McGraw-Hill	2017, 1st Edition
2	**Guido van Rossum and Fred L. Drake Jr**	An Introduction to Python – Revised and updated for Python 3.2	Python Software Foundation, Network Theory Ltd	2011,1st Edition
3	**Wesley J Chun**	Core Python Applications Programming	Prentice Hall	2012, 3 rd Edition

Pedagogy

- Chalk and Talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

Course Designer

Dr . G.Sangeetha

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN23C05	DATA STRUCTURE AND ALGORITHM	THEORY	58	2	-	3

Preamble

To provide an overview of data structures and algorithm design methods for programming and problem-solving process.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall about the concepts of Arrays, Stack, Queue, Link List, Trees and Graph.	K1
CLO2	Understand sorting, searching and hashing algorithm	K2
CLO3	Apply the data structures to solve various computing algorithms and sorting algorithms.	K3
CLO4	Analyze lists, queues, stacks, trees and graph according to the needs of different applications	K4

Mapping with Programme Learning Outcomes

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

S- Strong; M-Medium; L-Low

DATA STRUCTURE AND ALGORITHM- IN23C05 58 Hrs

Syllabus

UNIT-I 12 Hrs

Introduction to Data Structure: Definition, Basic Terminology, Elementary Data Organization - Types of Data Structures- Linear & Non-Linear Data Structures-Data Structure Operations. Algorithm Specifications: Performance Analysis and Measurement (Time and space analysis). **Abstract Data Types- Advantages of ADT.** Array: Representation of arrays, Types of arrays, Applications of arrays, Sparse matrix and its representation**.**

UNIT-II 12 Hrs

Stacks and Queues: Stack-Stack Representation & Implementation-Stack Operations-**Applications of Stack.** Queue-Queue Representation & Implementation-Queue Operations-**Types of Queues**.

UNIT-III **11 Hrs**

Linked List: Linked List as Data Structures- Representation of Linked List-Operations on Linked List-Stack as Linked List-Queue as Linked List-**Doubly Linked List-Circular List.**

UNIT-IV **13 Hrs**

Trees: Preliminaries-Binary Trees-**B-Trees**. Graph: Graph Terminologies-**Types of Graphs**-Graph Representation. **Hashing: Hash Functions.** Sorting: Bubble Sort-Selection Sort-QuickSort-Heap Sort-Merge Sort.

UNIT-V **10 Hrs**

Algorithm Design Techniques: Greedy Algorithms - Prim's Algorithm, Kruskal's Algorithm. **Divide and Conquer: Running Time of Divide and conquer algorithms.** Decrease and Conquer-Depth First Search and Breadth First Search. Backtracking Algorithms - n Queens Problem, **Branch and Bound – Traveling Salesman Problem.**

Text Books

S.No.	Authors	Title	Publishers	Year and Edition
1.	Rajesh K. Shukla	Data Structures using C & C++	Wiley India	2009
2.	Seymour Lipschutz, G A Vijayalakshmi Pai	Data Structures	Tata McGraw-Hill	2014

Reference Books

S.No.	Authors	Title	Publishers	Year and Edition
1.	Anany Levitin	Introduction to Design and Analysis of Algorithms	Pearson Education	2009
2.	Wisnu Anggoro	C++ Data Structures and Algorithms	Packt Publishing	2018
3.	YedidyahLangsam, Moshe J.Augentein, aron M.Tenenbaum	Data Structures using C & C++	PHI Learning, 2nd Edition	2009

Pedagogy

- Chalk & talk, PPT, Group Discussion, Assignment, Demo, Quiz, Role play.

Course Designer

Dr. R. Jeevitha

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN24CP2	PYTHON PROGRAMMING LAB	PRACTICAL	-	-	75	2

Preamble

The course gives hands-on experience on Python Programming and improves the practical skill set. The learner will be able to develop the logic for the given problem, recognize and understand the syntax and construction of Python code. The course involved in compiling, linking and debugging Python code and developing somecomplex programs.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Identify the basic terminologies of Python programming such as data types, conditional statement, looping statements and functions.	K1
CLO2	Develop programs with implementation of operators & I/O operations	K2
CLO3	Construct programs with features of Lists, Strings.	K3
CLO4	Develop readable programs with files for Exception handling concepts.	K4

Mapping with Programme Outcomes

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

S- Strong; M-Medium; L-Low

PYTHON PROGRAMMING LAB- IN24CP2 75Hrs

Program List

- Exercise programs on basic control structures & loops.
- Exercise programs on operators & I/O operations.
- Exercise programs on Python Script.

- Exercise programs on Lists.
- Exercise programs on Strings.
- Exercise programs on functions.
- Exercise programs on recursion & parameter passing techniques.
- Exercise programs on Tuples.
- Exercise programs on file.
- Exercise programs on Exception handling concepts.
- Exercise programs on modules and packages

Pedagogy

- Demonstration of working environment/Tools/Software/Program

Course Designer
Dr. G.Sangeetha

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
IN23C06	DATABASE MANAGEMENT SYSTEM	Theory	58	2	-	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	M	S	M	S	M
CLO2	S	M	M	S	M
CLO3	M	S	S	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium;.

DATABASE MANAGEMENT SYSTEMS – IN23C06 58 Hrs

Syllabus

Unit – I 12 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 – De normalization**.

Unit – II 12 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 a newrow/record – updating and deleting existing rows/records - Retrieving data from table.

Unit-III 12Hrs

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

Unit – IV 12 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** - cursor FOR loops - Records - Tables - **Procedures -Functions – Triggers**

Unit – V 10 Hrs

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

Text Book

S. No	Author	Title of the Book	Publisher	Year and Edition
1.	Nilesh Shah	Database Systems UsingOracle	PHI	2016, 2nd Edn
2.	Gaur av Vaish	Getting Started with NoSQL	Packt	2013,1 st Edn

Reference Books

S. No	Author	Title of the Book	Publisher	Year and Edition
1	Rajesh Narang	Database Management Systems	Prentice Hall of India,	2011, 2nd Edn,
3	Kristina Chodoro w	MongoDB: DefinitiveGuide	Oreilly	2015,2nd Edn,

Pedagogy

- Chalk and talk PPT, Discussion, Assignment, Demo, Quiz, Flipped mode.

Course Designers

Dr. G.SANGEETHA

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
IN23C07	DIGITAL LOGIC AND CIRCUITS	THEORY	58	2	-	3

Preamble

To impart the knowledge on simulation of digital system and functionality of Combinationalcircuits Boolean Algebra and flip flops.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the principles of binary number system and basic logicgates.	K1
CLO2	Understand the operations on Boolean laws and Theorems and Karnaugh Map	K2
CLO3	Applying the basic principles and types of registers, counters and the functionality of Multiplexers and Flip Flops	K3
CLO4	Analyze the concept of Memory Addressing and programmable logic devices	K4

Mapping with Programme Learning Outcomes

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

S- Strong; M-Medium;

DIGITAL LOGIC AND CIRCUITS - IN23C07 (58Hrs)

Syllabus

UNIT I: 12 hrs

Number Systems and Codes: Binary Number system – Binary to Decimal –Decimal to Binary – Hexa Decimal — Excess-3 Code – Gray code- **Error Detection and Correction. DIGITAL LOGIC:The Basic Gates – NOT, OR, AND - Universal Logic Gates – NOR, NAND.**

UNIT II: 12 hrs

Combinational Circuits: Boolean Laws and Theorems - Sum of Products method – Truth table to Karnaugh Map –Don't Care Conditions- Product-of sums method -Product-of sums Simplifications.

UNIT III: 12 hrs

Data Processing Circuits: Multiplexers – Demultiplexers- Encoders –Decoders. **Flip-Flops**-RS Flip- Flops - **Edge-triggered D Flip-flops--Edge-triggered JK Flip-Flops-JK Master Slave Flip-**

flops.

UNIT IV: 11 hrs

Types of Registers: Serial In-Serial Out – Serial In-Parallel Out – Parallel in Serial Out - Parallel In- Parallel Out – Universal Shift Register. **COUNTERS:** Ring Counter –Ripple Counter – Asynchronous Counter - Synchronous Counter.

UNIT V: 11 hrs

Memory: Magnetic Memory – optical memory – Memory Addressing – ROM – RAM – EPROM – PROM –**Sequential programmable logic devices – Content Addressable memory**.

Text Book

S.No.	Authors	Title	Publishers	Year and Edition
1	Donald P Leach, Albert Paul Malvino, Goutam Saha	Digital Principles and Applications	M cGraw-Hill Education,8th edition	2015, 7th Edn

Reference Books

S.No.	Authors	Title	Publishers	Year and Edition
1	R.Anantha Natarajan	Digital Design	PHI Learning	2015, 1 st Edn
2	K.Meena	Principles of Digital Electronics	PHI Learning	2013, 1 st Edn

Pedagogy

Chalk & talk PPT, Group Discussion, Assignment, Demo, Quiz, Role play.

Course Designer
Dr.R.Jeevitha

Course Code	Course Title	Category	L	T	P	Credit
CS23SBGP	Gen-AI	Theory	44	1	-	3

Preamble

The objective of this course is to understand the breadth and depth of Generative Artificial Intelligence (Gen AI) and to impart knowledge on its ethical implications, practical applications, and emerging trends.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the fundamental concepts and ethical considerations of Generative AI.	**K2**
CLO2	Apply AI principles in practical settings using basic AI tools and platforms	**K3**
CLO3	Develop advanced skills in specialized AI applications such as text analysis, natural language processing, and image recognition.	**K3**
CLO4	Explore emerging trends in AI, integrating advanced AI tools into diverse professional practices.	**K4**

Mapping with Programme Learning Outcomes

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

S- Strong; M-Medium.

SBS I: Gen-AI - CS23SBGP (45 Hrs)

Unit 1: Introduction to Gen AI 9 hours

Understanding Gen AI: Definition and scope of Gen AI - Overview of its applications in various fields - Introduction to essential skills needed for Gen AI. Ethical Considerations: Discussion on ethical guidelines and responsible use of AI - Understanding the impact of AI on society and individuals.

Hands-on Activity: Exploring AI Tools

- Working with appropriate content creation Gen-AI tools to engage with ChatGPT to explore various subjects, simulate interviews, or create imaginative written content.
- Working with appropriate writing and rephrasing Gen-AI tools to drafting essays on designated topics and refining the content with improved clarity, coherence, and correctness.

Unit 2: Basic AI Concepts 8 hours

Introduction to AI: Basic concepts and terminology of artificial intelligence - Examples of AI in everyday life - Real-world examples of AI applications in different domains. Machine Learning Basics: Understanding the principles of machine learning - Overview of supervised and unsupervised learning.

Hands-on Activity: Simple AI Projects

- Working with appropriate educational content creation Gen-AI tools to generate quizzes and flashcards based on classroom material.
- Working with appropriate language learning Gen-AI tools to practice and enhance language skills through interactive exercises and games across multiple languages.

Unit 3: AI in Practice 9 hours

Text Analysis and Natural Language Processing (NLP): Introduction to NLP concepts and techniques - Hands-on exercises analyzing text data and extracting insights. Image Recognition and Processing: Basics

of image recognition algorithms and techniques - AI Tools for Text and Image Processing

Hands-on Activity: Text and Image Projects

- Working with appropriate image processing Gen-AI tools to experiment with AI-generated images.
- Working with appropriate object recognition Gen-AI tools to identify various objects such as text, images, products, plants, animals, artworks, barcodes, and QR codes.

Unit 4: AI for Productivity and Creativity **9 hours**

AI-enhanced Productivity and creativity Tools: Overview of productivity and creativity tools enhanced with AI capabilities - Tips for integrating AI into daily tasks and workflows. AI and Jobs: Exploring how AI impacts jobs and industries - Discussion on opportunities and challenges - Exploration of AI-powered creative tools and applications.

Hands-on Activity: Productivity and Creativity

- Working with appropriate content creation Gen-AI tools to generate interactive videos / blog posts / art / drawing / music and storytelling experience.
- Working with appropriate resume generation Gen-AI tools to create professional resumes efficiently.

Unit 5: Future of Gen AI and Final Project **9 hours**

Emerging Trends in Gen AI - Applications of Generative AI - Ethical and Societal Impact of Gen AI - Future Directions and Challenges - Case Studies in Generative AI.

Hands-on Activity: Trends in Gen AI

- Working with appropriate speech generation Gen-AI tools to customize synthetic speech for virtual assistance across different applications.
- Working with appropriate data analysis Gen-AI tools to perform data analysis, visualization, and predictive modeling tasks.
- Working with appropriate Gen-AI design tools to simplify the creation of visually appealing presentations.
- Working with appropriate website builder Gen-AI tools to develop professional websites with AI assistance.

Pedagogy

Demonstration of AI Tools, Lectures and Case studies.

Course Designer

Mrs. G.Rubadevi

Evaluation pattern for Gen-AI

Quiz	: 50 Marks (5 quizzes with each 10 marks)
Case study	: 25 Marks
Online Exam	: 25 Marks (Departments to plan and conduct the exam)
Total	: **100 Marks**

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
IN23CP3	DBMS LAB	PRACTICAL	-	-	75	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.

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	M	S	S	M
CO2	S	M	S	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium.

DBMS LAB - IN23CP3 75 Hrs

Program List

- Different data types and operators.
- ER diagram with entities , attribute ,keys and relations.
- Integrity constraints
- Built-in functions and views.
- Create, insert, update and alter table.
- Implement PL/SQL Block.

- Control Structures and Embedded SQL
- Splitting and Joining the table
- PL/SQL Functions
- PL/SQL Procedure
- A case study and formulate the problem statement on a specify project.

Pedagogy

- Demonstration of working environment/Tools/Software/Program

Course Designers

Dr. V. Deepa

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
IN23C08	COMPUTER NETWORKS	Theory	58	2	-	3

Preamble

The subject is intended to provide the student with the in-depth knowledge of Networks. It also shedslight around wide spread applications of the Internet.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Tell about the Fundamental concepts of Data communication, Transmission Media and Networking.	K1
CLO2	Understand data communication using the network topologies, layered model and internetworking.	K2
CLO3	Apply the networking concepts and communication protocol in real-time Applications,Virtual LAN Management	K3
CLO4	Analyze the principles of data communication, devices, transmission Mechanism and network protocols.	K4

Mapping with Programme Learning Outcomes

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

S- Strong; M-Medium;

Computer Networks - IN23C08 (58 hours)

Unit 1: (12 hours)

Introduction to Networks: Classifications of computer networks- - Modes of Data Transmission: Simple, Half duplex, Full duplex communication -Topologies of Computer Networks - The OSI Reference Model: Introduction to the OSI Reference Model - Seven Layers - Functions of OSI Reference Model- Protocols and Standards- Internetworking devices .

Unit 2 (12 hours)

Transmission Media: Guided Media- Unguided Media, - Techniques for Bandwidth utilization: Multiplexing - Frequency division, Time division and Wave division, Concepts on spread spectrum. Data Link Layer: Error Deduction and Correction-Sliding window protocol-Stop and wait protocol. LAN: Wired LAN, Wireless LAN, Virtual LAN : Managing VLAN and its benefits.

Unit 3 (11 hours)

Network Layer Services : Switching: Circuit Switched Network-Packet -Switching-Structure of a switch- IP Addressing: The Purpose of IP addresses - The Hierarchy of IP Addresses-Routing Algorithms – Static routing protocols-Routing Information Protocol- Open Shortest Path First Protocol .

Unit 4 **(11 hours)**

Transport Layer: Connection establishment, Connection release, The Internet Transport Protocols: UDP, TCP. Application Layer: Providing services, Applications layer paradigms: DNS-Client server model, HTTP, E-mail, WWW, TELNET.

Unit 5 **(12 hours)**

Wireless and Mobile Networks: Wireless links, Characteristics-CDMA- Bluetooth - Architecture-Bluetooth layers. Satellite Networks -Operation, GEO, MEO and LEO satellites. Cellular Internet Access-Architecture, Standards-3G,4G,5G, Near Field Communication (NFC). Mobility - Principles, Addressing and routing to mobile users, Mobile IP, Handling mobility in Cellular Networks.

Text Book

S. No	Authors	Title	Publishers	Year and Edition
1.	Behrouz A. Forouzan	Data Communications and Networking	Tata McGraw-Hill PubCompany Ltd,	2017, 5th Edn
2	SilviuAngelescu	CCNA Certification All-in - One For Dummies	For Dummies	2010,1st Edn
3	Andrew S. Tanenbaum	Computer Networks	Prentice Hall of India,4th Edition	2012,1st Edn

Books for Reference

S. No	Authors	Title	Publishers	Year and Edition
1.	Larry L Peterson, Bruce S Davie	Computer Networks - A systems approach	Elsevier Press	2012,5th Edn
2	PrakashC.Gupta	Data Communication & Computer Networks	PHI Learning Pvt Ltd 2nd Edition	2014,1st Edn

Pedagogy

- Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz, Case study, ICT tools.

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
IN24C09	OOPs WITH JAVA	THEORY	58	2	-	3

Preamble

This course gives in-depth knowledge of JAVA and OOPs concepts. It has been designed to enable novice programmers to enhance their programming skills. It also sheds light around wide spread applications of the internet.

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 OOP's and Java Concepts	K1
CLO2	Understand the concepts of Inheritance, Exceptions & I/O Classes	K2
CLO3	Develop the applications by applying Streams and Collections	K3
CLO4	Analyze & implement the real- time applications by AWT	K4

Mapping with Programme Learning Outcomes

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

S- Strong; M-Medium;

OOPs WITH JAVA – IN24C09
Syllabus

UNIT I **(12 Hrs)**

Introduction to Object Oriented Programming Paradigm and Java Language: Introduction – Evaluation of Higher Level Languages – Object Oriented Programming Paradigm – Evolution of Java – Salient Features of Java Language -Internet and world wide web – Java Environment – Java Language Preliminaries – Operators and Expressions – Control Structures.

UNIT II **(11 Hrs)**

Classes, Objects and Methods: Introduction- Class Definition Instance Variables and Member Methods-Declaration of Objects and Accessing Members – Classification of Members methods-Constructors- Passing Objects to Methods as Arguments – Static Member Data – Static member Methods –Recursion-Variable Arguments- Garbage Collection and Finalize method.

UNIT III **(12 Hrs)**

Inheritance: Introduction – Types of Inheritance - Constructors and Inheritance – Abstract classes and methods- Interface. Packages: Classification of packages-creating and using a package- Importing classes from packages - Nested packages – Access Control.

UNIT IV **(12 Hrs)**

Exception Handling: Types of Exceptions: - Built-in-Exceptions- Custom Exception–Try Block – Nested Try Blocks –Throw Statement – Finally Statement - Multithreaded

Programming: The **Java** Thread Model – The Thread Class – The Main Thread – Creating Our Own thread – Deadlock

UNIT V **(11Hrs)**

Introduction to AWT: AWT Hierarchy – AWT Controls – Layout Managers – Handling Keyboard Events - Handling Mouse Events – The Java Collections Framework: The collection interface – The Collection classes.

Text Book

S.No	Author	Title of the Book	Publishers	Year and Publication
1.	M.T. Somashekara, D.S,Guru&K.S.Manjunatha.	Object Oriented Programming with Java	PHI Learning Pvt Ltd,Delhi	2017,2nd Edn

Books for Reference

S.No	Author	Title of the Book	Publishers	Year and Publication
1	Rajkumar Buyya, S Thamarai Selvi, Xingchen Chu	Object Oriented Programming with Java	Tata McGraw Hill	2009,1st Edn
2	Ken Arnold,James Gosling, David Holmes	The Java Programming Language	Addison-Wesley	2005,1st Edn

Pedagogy

- Chalk and talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

Course Designer

Dr. G.Sangeetha

COURSE CODE	COURSE TITLE	CATEGOR Y	L	T	P	CREDIT
IN24CP4	OOPs PROGRAMMING LAB	PRATICAL	-	-	75	2

Preamble

The course is designed to develop application using Java Principles. It helps to apply the concepts of Java and OOPs in different applications.

Course Learning Outcomes

On the Successful Completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the features of OOP's & Java	K1
CLO2	Understand the various types of Methods	K2
CLO3	Apply the concepts of C Threads and Collections	K3
CLO4	Implement the real-time applications by using Events.	K4

Mapping with Programme Learning Outcomes

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

S- Strong; M-Medium;

OOPs PROGRAMMING LAB - IN24CP4 75 Hrs

Program List

- Program with Class & Objects
- Program with Constructor
- Program with Recursion
- Program to implement Inheritance
- Program to implement Packages
- Program to create an interface and implement in a class
- Program to implement Exception Handling
- Program to create two Threads.
- Program with Collections
- A program to create and manage Events

Pedagogy

- Demonstration of working environment/Tools/Software/Program

Course Designer

Dr. G. Sangeetha
Dr. R. Sivaranjani

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
AP23A01	DIGITAL MARKETING	THEORY	58	2	-	3

Preamble

This course provides an overall understanding of the various digital marketing platforms and tools available for creating an effective digital marketing strategy. It provides technical skills to design and develop an integrated digital marketing plan for an organization.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the role of digital marketing in marketing strategy	K1
CLO2	Understand the key elements of a digital marketing strategy	K2
CLO3	Apply the role that social marketing plays in the digital marketing	K3
CLO4	Analyze common digital marketing tools such as SEO and Social media and apply conceptual frame works of digital marketing	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.

Digital Marketing - AP23A01

Unit – I **(12 Hrs)**

Introduction to Digital Marketing: Introduction - Original and Development of Digital Marketing - Internet Users: Penetration and Kind of Internet Use - Digital Marketing strategy – Digital Advertising Marketing Plan - Ethical and legal of framework of Digital Marketing - Skills Required in Digital Marketing - Digital Advertising: Introduction - Concept of display advertising - Digital Metrics

Types of Digital Ad - Targeting in digital marketing - Challenges faced by display marketing.

Unit – II **(11 Hrs)**

Search Engine Advertising: Introduction – Why pay for search advertising? – Understanding Ad Placement – Understanding Ad Ranks – Why is the Ad rank important? – Create your first Ad Campaign – Google Ads Account – Best practices for creating effective Ads - Enhance your Ad Campaign – Performance Reports – E-Commerce

Unit – III **(12 Hrs)**

Face book Marketing : Introduction – Organic Marketing – Paid Marketing – Facebook Insights LinkedIn: Introduction - LinkedIn Strategy - Content Strategy - LinkedIn Native Videos - LinkedIn Analytics - Asset

Copying - LinkedIn Sales Navigator - Emerging Platforms: Instagram

Unit – IV **(12 Hrs)**

Search Engine Optimization: Introduction – Search Engine – The Concept of SEO – SEO Phases – Website Audit – Content – Social Media Reach – Maintenance – Local Search SEO – SEO Visual Search – Voice Change will change the SEO Industry – Sub domains vs Subfolders – Website Navigation - External Links – Pop-ups – Advanced Website Features.

Unit – V **(11 Hrs)**

Mobile Marketing: Introduction – Mobile Advertising – Mobile Marketing Toolkit – Mobile Marketing Features – Mobile Analytics. Digital Analytics: Introduction – Data Collection – Key Metrics – Experience Analysis – Making Web Analytics Actionable – Types of Tracking Code – Competitive Intelligence.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR and Edition
1	Seema Gupta	Digital Marketing	McGraw Hill	2018, 2nd Edn,

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR and Edition
1	Simon Kingsnorth	Digital Marketing Strategy: An Integrated Approach to Online Marketing 2nd Edition	Kogan Page	2019, 2nd Edn
2	Dave Chaffey	Digital Marketing	Pearson	2019, 7th Edn
3	Stephanie Diamond	Digital Marketing All-in-One for Dummies	For Dummies	2019, 1st Edn,
4	Kevin Hartman	Digital Marketing Analytics: In Theory and In Practice	Ostmen Bennett Bridge Publishing Services	2020, 2nd Edn,

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designer

Dr. G. Sangeetha

Sno	LEARNING METHODS	PERCENTAGE
1	Participatory Learning	30%
2	Experiential Learning	30%
3	Problem-based Learning	40%

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CS23A02	M-COMMERCE	THEORY	58	2	-	3

Preamble

This course provides an insight on M-Commerce principles and business models. It also explores the concept of mobile commerce technologies, applications, mobile payment methods, security, and ethics.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the fundamental concept of E- commerce and process of business models	K1
CLO2	Understand the architecture and applications of M- Commerce	K2
CLO3	Illustrate the risks, issues, legal and security aspects in M-Commerce	K3
CLO4	Analyze the infrastructure, fraud prevention and payment methodologies and examine the legal and ethical issues in mobile commerce	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	S	S	M	S

S-Strong; M-Medium;

M-Commerce - CS23A02 (58 Hrs)

Syllabus

Unit I (12 Hrs)

Introduction to E- commerce: Introduction - E-commerce - E-business - Categories of E-commerce applications - Traditional and Electronic commerce - Advantages and disadvantages of E-commerce. Business Models of E-commerce: Introduction - Business models of E-commerce- Business to Consumer (B2C) - Business to Business (B2B) - Difference between B2C and B2B - C2C: Definition - Characteristics and Applications of C2C EC

Unit II (11 Hrs)

Mobile commerce and WAP: Introduction to Mobile commerce - Application - Advantages of M-commerce - Wireless Application Protocol - WAP Browser - Features of WAP 2.0 - Technologies of M-commerce

Unit III (12 Hrs)

Mobile commerce Risk, Security and Payment Methods: Introduction - Security and Payment Methods - Mobile Commerce Security - Security Mechanism - Mobile Security - Network Infrastructure and Security- WLAN and Security - WAP and Security - Mobile commerce payment methods - Mobile payment operations

Unit IV **(12 Hrs)**

Mobile Money Infrastructure and Fraud Prevention for M- Payment: Introduction - Requirement for authentication infrastructure for M-commerce - Trust relationship - Requirement for Mobile commerce - Password based authentication for mobile users with support for public key technology - M - payment value chain - Life cycle - Operational Issues in M-Commerce payment - Mobile payment systems - General analysis of the payment solutions

Unit V **(11 Hrs)**

Legal and Ethical Issues : Introduction - Issues related to E- commerce - Legal issues - Taxation and E-commerce - Cyber Laws : Introduction - Cyber laws in India - Salient Provisions of Cyber Law - Contracting and contract Enforcement - IT act 2000

Text Book

S. No	Author	Title of the Book	Publisher	Year and Edition
1	Dr. U.S. Pandey & Er. Saurabh Shukla	E- Commerce and Mobile Commerce Technologies	S. Chand & Company Pvt. Ltd	2014,2nd Edn

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Karabi Bandyopadhyay	Mobile Commerce	Prentice Hall India Learning Private Limited	2013,1st Edn,
2	Paul May	Mobile Commerce: Opportunities, Applications, and Technologies of Wireless Business	Cambridge University Press;	2001,1st Edn,
3	Norman Sadeh	M-Commerce: Technologies, Services, and Business Models	John Wiley & Sons,	2003,1st Edn

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

COURSECODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
IN23SCE1	R PROGRAMMING	Theory		-	45	3

R PROGRAMMING

Course Contents **45 Hrs**

- Background, Getting started, and Nuts and Bolts-(13 hours)
- Programming with R (12 hours)
- Loop functions and debugging. (9 hours)
- Simulation and Profiling. (11 hours)