## 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.



# Department of Information Technology Choice Based Credit System & Learning Outcomes Based Curriculum Framework Bachelor of Information Technology - 2024 -2027 Batch & Onwards Semester I

			D 42		_							
			Title of Paper		Instruction Hours / Week	Hours	Hours	Duration of Examination	Examination Marks			
Semester	Part	Subject Code	Title of Paper	Category	Instructi Week	Contact Hours	Tutorial Hours	Duration	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	Е	4	58	2	3	25	75	100	3
I	Ш	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
Ι	III	AP24C03	Core 3: Operating Systems Fundamentals - Linux	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
Ι	III	IN24CP1	Lab1: Programming in C lab	CC	3	45	-	3	15*	35*	50	2
				Non Ta	mil Stud	lents	1	1		1		
I	IV	NME23B1 / NME23A1	Basic Tamil I / Advance Tamil I	AEC	2	28	2	-	100	-	100	
			Students with	Tamil a	as Langu	iage						2
I	IV	NME23ES	Introduction to Entrepreneurship	AEC	2	30	_	-	100	-	100	

		24BONL1	Online Course-I	ACC	-	-	-	-	-	-	-		<u>-</u>
I -V	VI	24BONL2	Online Course-II										
		24BONL3	Online Course-IIII										
I	IV		Job Oriented Course: Amazon Web Services/Cisco Certified network Associate/Micros 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	СС	4	58	2	3	25	75	100	3	
П	III	IN24CP2	Python Programming Lab	СС	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 - II Online Course - III	ACC	-	-	-	-	-	-	-	-	

\*CA conducted for 425 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 Enhancement Course ACC: Additional Credit Course

#### 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	
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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

COURSE NUMBER	COURSE NAME	CATEGORY	L	Т	P	CREDIT
CY24C01	PROGRAMMING IN C	Theory	58	2	ı	3

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	К3
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, 8 <sup>th</sup> Edition,
	2	P. Kaliraj, T. Devi	Higher Education for Industry 4.0 and Transformation to Education 5.0	CRC Press - Taylor & Francis Group	2021, 1 <sup>st</sup> Edition,

#### **Reference Books**

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

#### **Pedagogy**

• Lectures, Group discussions, Demonstrations

#### **Course Designer**

Dr. S. Beula Princy

COURSE NUMBER	COURSE NAME	CATEGORY	L	Т	P	CREDIT
	COMPUTATIONAL AND					
PP22C02	ALGORITHMIC THINKING		1.5			
	FOR PROBLEM SOLVING	Theory	45	-	-	3

- 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	К3
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	2014,1 <sup>st</sup> Edition
2	Paolo Ferragina, Fabrizio Luccio	Computational Thinking First Algorithms	Springer	2018, 1 <sup>st</sup> Edition
3	Karl Beecher	Computational Thinking  – A beginner's guide to problem solving	BSC publication	2017, 1 <sup>st</sup> 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	ı	1	45	2

- 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.	К3
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	Т	P	CREDIT
AP24C03	OPERATING SYSTEMS FUNDAMENTALS - LINUX	THEORY	58	2	1	3

- 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	CLO Statement	Knowledge Level
Number		
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.	К3

#### **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	OPERATING	Wiley Publishers	2018 ,10 <sup>th</sup>
	Silberschatz,	SYSTEMS CONCEPTS		Edition
	Peter Baer			
	Galvin, G Gagne			
2	Christopher	LINUX BIBLE	Wiley	2020, 10 <sup>th</sup>
2	Negus	LINUA BIBLE	vv ney	Edition

#### **Reference Books**

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

#### **Pedagogy**

Demonstration of working environment/Tools/Software/Program

Course Designer Mrs. G. Rubadevi

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

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	К3
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	2013,5 <sup>th</sup> edition
2		Think Python: How to Think like a Computer Scientist(Unit IV-V)	O'Reilly Publishers,	2016, 2 <sup>nd</sup> Edition,
3	Kapil Kapoor,	2 3	Indian Institute of Advanced Study	2005,1 <sup>st</sup> Edition

#### **Reference Books**

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

#### **Pedagogy**

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

#### **Course Designer**

Dr. G.Sangeetha

COURSE CODE	COURSE NAME	CATEGORY	L	Т	P	CREDIT
IN23C05	DATA STRUCTURE AND ALGORITHM	THEORY	58	2	1	3

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.	К3
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-Quick Sort-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, 2 <sup>nd</sup> Edition	2009

#### **Pedagogy**

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

#### **Course Designer**

Dr. R. Jeevitha

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

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.	К3
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