

Scheme Based on AICTE Flexible Curriculum

Bachelor of Technology (B.Tech)

Department of Computer Science & Engineering-AIML

Semester III

Sr. No.	Course Type	Course Code	Course Name	Teaching Scheme			Credits
				L	T	P	
1.	BSC	MA03	Probability & Statistics	2	1	-	3
2.	PCC	CL01	Computer Organization & Architecture	2	1	-	3
3.	PCC	CL02	Data Structure & Algorithm	2	1	-	3
4.	PCC	CL03	Object Oriented Programming & Methodology	2	1	-	3
5.	PCC	CL04	Introduction to Artificial Intelligence	2	-	-	2
6.	HSMC	HS04	Entrepreneurship and Principles of Management	1	-	-	1
7.	LC	CL01(P)	Computer Organization & Architecture Lab	-	-	2	1
8.	LC	CL02(P)	Data Structure & Algorithm Lab	-	-	2	1
9.	LC	CL03(P)	Object Oriented Programming & Methodology Lab	-	-	2	1
10.	LC	CL04(P)	Artificial Intelligence Lab	-	-	2	1
11.	LC	CL05(P)	Programming in Python Lab	-	-	2	1
12	PROJ	CL01	Seminar	-	-	2	1
13.	MLC	MLC01	Professional Laws, Ethics, Gender, Human Values and Harmony	1	-	-	Audit
14	LLC	LLC02	Liberal Learning Course-II	—	—	—	Credit to be added in Fourth Semester
Total Academic Engagement and Credits							21

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Semester III

PCC-CL01	Computer Organization & Architecture	2L:1T(4hrs.)	Credits:3
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Prerequisite: Basic Electronics Engineering

Course Objectives:

Students are familiarized with the basic principles of computer architecture, Design and Multiprocessing, Types of data transfer, Concept of semiconductor memories which is useful for research work in field Computer System.

Module 1: (08hrs.)

Basic Structure of Computer: Structure of Desktop Computers, CPU: General Register Organization-Memory Register, Instruction Register, Stack Organization, Instruction Format, Fetch and Execution cycle, Instruction Types, ALU, I/O System, CPU and Memory Program Counter, Bus Structure Register Transfer Language-Bus and Memory Transfer, addressing modes.

Module 2: (10hrs.)

Control Unit Organization: Micro Instruction Formats, Hardwired control unit, Micro-programmed Control unit, micro program sequencer, Control Memory, Sequencing and Execution of Micro Instruction. Computer Arithmetic: Number Concepts, 1's and 2's Complement Representation, Signed Addition and Subtraction, Addition and Subtraction using 2's Complement. Multiplication and division, Booths Algorithm, Division Operation, Floating Point Arithmetic Operation.

Module 3: (08hrs.)

I/O Organization: Introduction of I/O Interface-PCI Bus, SCSI Bus, USB, Data Transfer: Serial, Parallel, Synchronous, Asynchronous, handshaking methods, Modes of Data Transfer: Programmed I/O, Interrupt- initiated I/O, parallel priority interrupt, Daisy chaining method, Direct Memory Access (DMA), I/O Processor.

Module 4: (08hrs.)

Memory Organization: Main memory-RAM, ROM, Secondary Memory-Magnetic Tape, Disk, Optical Storage, Associative Memory and match logic, Cache Memory: Cache Structure and Design, Mapping Scheme, Replacement Algorithm, Improving Cache Performance, Virtual Memory, memory management hardware

Module 5: (08hrs.)

Multiprocessors: Characteristics of Multiprocessor, Inter-Processor Communication and Synchronization. Memory in Multiprocessor System, Concept of Pipelining, Vector Processing, Array Processing, RISC And CISC, Study of Multicore Processor -Intel, AMD.

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Course Outcomes:

1. Explain the basic structure & components of the computer system, Micro programmed Control Unit.
2. Demonstrate the concepts of computer arithmetic.
3. Explain the input output organization of the computer system.
4. Illustrate memory organization and memory management techniques.
5. State the core concepts of multiprocessor and pipelining.

List of Text/Reference Books:

1. Morris Mano, “Computer System Architecture” 3rdEd.,2007, PHI
2. Alan Clements: “Computer Organization and Architecture”, 2012, Cengage Learning
3. Subrata Ghosal: “Computer Architecture and Organization”, 2011, Pearson Education
4. William stalling, “Computer Organization and Architecture”10thEd., 2016, Pearson Education
5. M. Usha, T.S. Shrikant: “Computer System Architecture & Organization”, 2019, Willey India
6. Chaudhuri, P. Pal: “Computer Organization and Design”, 3rdEd.PH

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Semester III

PCC-CL02	Data Structures & Algorithm	2L:1T(4hrs.)	Credits:3
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Prerequisite: Programming for Problem Solving

Course Objectives:

The objective of this course is to understand different types of data structures and algorithms used in programs.

Module 1: (10hrs.)

Review of C++ programming language. Introduction to Data Structure: Concepts of Data and Information, Classification of Data structures, Abstract Data Types, Implementation aspects: Memory representation. Analysis of algorithm: Time Complexity and Space Complexity, Data structures operations and its cost estimation, Basic of Asymptotic notation. Introduction to linear data structures- Arrays, representation & Operations, Linked List: Representation of linked list in memory, different implementation of linked list. Circular linked list, doubly linked list, etc. Application of linked list: polynomial manipulation using linked list, etc.

Module 2: (10hrs.)

Stacks: Stacks as ADT, Different implementation of stack, multiple stacks. Application of Stack: Conversion of infix to postfix notation using stack, evaluation of postfix expression, Recursion. Queues: Queues as ADT, Different implementation of queue, Circular queue, Concept of Dqueue and Priority Queue, Queue simulation, Application of queues.

Module 3: (10hrs.)

Tree: Definitions - Height, depth, order, degree etc. Binary Search Tree - Operations, Traversal, Search, AVL Tree, Heap, Applications and comparison of various types of tree; Introduction to forest, multi-way Tree, B tree, B+ tree.

Module 4: (08hrs.)

Graphs: Introduction, Classification of graph: Directed and Undirected graphs, etc., Representation, Graph Traversal: Depth First Search (DFS), Breadth First Search (BFS), Graph algorithm: Minimum Spanning Tree (MST)-Kruskal, Prim's algorithms. Dijkstra's shortest path algorithm; Comparison between different graph algorithms. Application of graphs.

Module 5: (08hrs.)

Sorting: Introduction, Classification of sorting method, Sort methods like: Bubble Sort, Quick sort. Selection sort, Heap sort, Insertion sort, Shell sort, Merge sort and Radix sort; comparison of various sorting techniques. Searching: Basic Search Techniques: Sequential search, Binary search, Comparison of search methods. Case study: Applications of various data structures in operating system, DBMS etc.

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Course Outcomes:

1. Understand basic data structures such as arrays, linked lists, stacks and queues.
2. Introduce the concept of data structures through ADT including List, Stack, Queues.
3. Understand the basic operations of trees and their types.
4. Understand the basic concept of graph and its operations.
5. Demonstrate and implement searching sorting algorithms.

List of Text/Reference Books:

1. Ellis Horowitz, Sartaj Sahni, "Fundamentals of Data Structures" Computer Science Press.
2. Mark Allen Weiss "Algorithms, Data Structures, and Problem Solving with C++", Pearson Education (US) 1996
3. R.G. Dromey "How to Solve it by Computer", 2nd Impression by, PHI
4. AM Tanenbaum, Y Langsam & M J Augustein, "Data structure using C and C++", 2nd Ed., 2006, Prentice Hall India.
5. Robert Kruse, Bruce Leung, "Data structures & Program Design in C", 2nd Ed., 1997, Pearson Education.
6. Aho, Hopcroft, Ullman, "Data Structures and Algorithms", Pearson Education.
7. Richard, Gilberg Behrouz, Forouzan, "Data structure—A Pseudo code Approach with C", 2nd Ed., Thomson press.

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Semester III

PCC-CL03	Object Oriented Programming & Methodology	2L:1T(4hrs.)	Credits:3
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Prerequisite: Programming for Problem Solving

Course Objectives:

The course is designed to provide complete knowledge of Object-Oriented Programming through and to enhance the programming skills of the students by giving practical assignments to be done in labs. Its main objective is to teach the basic concepts and techniques which form the object-oriented programming paradigm.

Module 1: (08hrs.)

Introduction to Object Oriented Programming, Comparison with Procedural Programming, features of Object-oriented paradigm, merits and demerits of OO methodology; Introduction to Java Development Kit (JDK) & Java virtual machine (JVM); Linker & Loader; Data Encapsulation: Concept of Classes & Objects; State, Behavior & Identity of an object.

Module 2: (08hrs.)

Data Abstraction and Message Passing: Methods, Calling of constructors, Decision making constructs, Control loops, Keywords: this, static; Access modifiers, Arrays within a class, String Class.

Module 3: (10hrs.)

Relationship between classes: Generalization- Inheritance, Types of Inheritance, Ambiguity in multiple inheritances, Concept of interfaces; Specialization- Association, Aggregation and Composition; Static and Dynamic Binding: Polymorphism, Method Overriding & Overloading; Keywords: super, abstract, final.

Module 4: (08hrs.)

Concept of Packages, Need of package; Basic idea of exception handling, stack-based execution and exception propagation, Exception types: Exception Handling Try, Catch, Finally, Throw statement, Assertions.

Module 5: (08hrs.)

Overview of Simple threads, Basic idea of Multithreaded Programming, Thread synchronization: Locks, synchronized methods, synchronized block, thread scheduling, Producer-consumer relationship, Daemon thread, Case Study: Chabot implementation etc.

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Semester III

Course Outcomes:

1. Understand object-oriented programming concepts, core JAVA, and apply them in solving Problems.
2. Develop skill in data abstraction and message passing.
3. Understand fundamentals of relationship amongst objects.
4. Learn about the need for exceptions and errors.
5. Develop ability to write a computer program to solve specified problems.

List of Text/Reference Books:

1. G. Booch, “Object Oriented Analysis & Design”, Pearson.
2. Barbara Liskov, Program Development in Java, Addison-Wesley, 2001.
3. James Martin, “Principles of Object-Oriented Analysis and Design”, Prentice Hall/PTR.
4. Peter Coad and Edward Yourdon, “Object Oriented Design”, Prentice Hall/PTR.
5. Herbert Schildt, “Java2: The Complete Reference”, 7th Edition, McGraw-Hill.

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Semester III

PCC-CL04	Introduction to Artificial Intelligence	2L:0T(2hrs.)	Credits:2
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Prerequisite: Preliminary knowledge of Elementary Statistics.

Course Objectives:

The course is designed to demonstrate fundamental understanding of Artificial Intelligence (AI) and its basic principles. The course will cover foundational concepts of AI that require problem solving, inference, perception, knowledge representation, and learning. Students will be able to understand the application of Artificial Intelligence techniques for problem solving.

Module 1: (08hrs.)

Introduction: Meaning and definition of artificial intelligence, Physical Symbol Sys-tem Hypothesis, production systems, Characteristics of production systems; Breadth first search and depth first search techniques. Heuristic search Techniques: Hill Climbing, Iterative deepening DFS, bidirectional search. Analysis of search methods. A* algorithm, and their analysis.

Module 2: (08hrs.)

Introduction to Genetic Algorithms: Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, logical consequences, syntax and semantics of an expression, semantic Tableau. Forward and backward reasoning. Proof methods, substitution and unification, conversion to clausal form, normal forms, resolution, refutation, deduction, theorem proving, inferencing, monotonic and non-monotonic reasoning.

Module 3: (09hrs.)

Introduction to prolog: Network-based representation and reasoning, Semantic networks, Conceptual Graphs, frames. Description logic (DL), concept language, reasoning using DL. Conceptual dependencies (CD), scripts, reasoning using CD.

Module 4: (08hrs.)

Introduction to natural language processing: Adversarial search and Game theory, classification of games, game playing strategies, prisoner's Dilemma. Game playing techniques, mini max procedure, alpha-beta cut- offs. Complexity of alpha-beta search. Automated planning, classical planning problem, forward planning, partial order planning, planning with proposal logic, hierarchical task planning, multi agent planning.

Module 5: (10hrs.)

Reasoning in uncertain environments, Fuzzy logic, fuzzy composition relation, operations on fuzzy sets. Probabilistic reasoning, Bayes theorem, construction of Bayesian networks, belief propagation. Markov processes and Hidden Markov models.

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Semester III

Course Outcomes:

1. State the core concepts of Artificial Intelligence, It's foundation and principles.
2. Examine the useful search techniques; learn their advantages, disadvantages and be able to develop intelligent systems.
3. Learn the practical applicability of intelligent systems, specifically its applications.
4. Understand AI in different areas like NLP, Pattern Recognition, game planning etc.
5. Understand important concepts like Expert Systems, AI applications.

List of Text/Reference Books:

1. Artificial Intelligence: Elaine Rich, Kevin Knight, Mc-Graw Hill.
2. Introduction to AI & Expert System: Dan W. Patterson, PHI.
3. Artificial Intelligence by Luger (Pearson Education)
4. Russel & Norvig, Artificial Intelligence: A Modern Approach, Pearson Education

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Semester III

PCC-LC-CL01(P)	Computer System Organization Lab	02P(2hrs.)	Credits:1
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Prerequisite:

Course Objectives:

Students are familiarized with the basic principles of computer architecture, Design and Multiprocessing, Types of data transfer, Concept of semiconductor memories which is useful for research work in field Computer System.

Module 1:

Introduction to Desktop Computers, Introduction to 8085 microprocessor, 8085 Instruction set, Flags, Logic Gates, Combinational circuits, Multiplexer, Demultiplexer.

Module 2:

Introduction to Binary number systems, 1's & 2's Complement, Arithmetic Operations, Half adder, Half subtractor, Full Adder and Full Subtractor.

Module 3:

Introduction to Assembly Language, Programming Arithmetic and Logic Operations, Shift Operations, Program Loops.

Module 4:

Memory Hierarchy, Main Memory, Types of Memory, Memory Allocation Methods, Virtual Memory, Page Replacement Algorithms.

Module 5:

Characteristics of Multiprocessor, RISC And CISC, Study of Multicore Processor–Intel, AMD.

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Semester III

Course Outcomes:

1. Explain the basic structure & components of the computer system, 8085Microprocessor.
2. Demonstrate the concepts of computer arithmetic.
3. Demonstrate the concepts of Assembly Language.
4. Illustrate memory organization and memory management techniques.
5. State the core concepts of multiprocessor.

List of Experiments:

1. Case study of Desktop Computers
2. Study of Multiplexer and Demultiplexer
3. Write Program to demonstrate Flags in microprocessor 8085.
4. Study of Half Adder and Half Subtractor.
5. Study of Full Adder and Full Subtractor.
6. Write a program to add the contents of memory locations 4000H and 4001H and place the result in memory location 4002H.
7. Write a program to multiply two 8-bit numbers stored in memory locations 2200H and 2201H by petitive addition and store the result in memory locations 2300H and 2301H.
8. Program for simulating memory allocation strategies (First fit, Best fit, Worst fit).
9. Programs for page replacement algorithms.
10. Case study of RISC And CISC.

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Semester III

PCC-LC-CL02(P)	Data Structure & Algorithm Lab	02P(2hrs.)	Credits:1
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Prerequisite:

Course Objectives:

The objective of this course is to understand different types of data structures and algorithms used in programs.

Module 1:

Arrays, String, & their representation & Operations.

Linked List: Representation of linked list in memory, different implementation of linked list. Circular linked list, doubly linked list, etc.

Module 2:

Stacks: Stacks as ADT, Different implementation of stack, multiple stacks. Application of Stack: Conversion of infix to postfix notation using stack, evaluation of postfix expression, Recursion, Example of recursion.

Module 3:

Queues: Queues as ADT, Different implementation of queue, Circular queue, Concept of Dequeue and Priority Queue, Queue simulation, Application of queues.

Module 4:

Tree: Definitions - Height, depth, order, degree etc. Binary Search Tree - Operations, Traversal, Search.

Graphs: Introduction, Classification of graph: Directed and Undirected graphs, etc., Representation, Graph Traversal: Depth First Search (DFS), Breadth First Search (BFS)

Module 5:

Sorting: Introduction, Classification of sorting method, Sort methods like: Bubble Sort, Quick sort. Selection sort, Heap sort, Insertion sort. Searching: Basic Search Techniques: Sequential search, Binary search, Comparison of search methods.

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Semester III

Course Outcomes:

1. Understand basic data structures such as arrays, linked lists.
2. Introduce the concept of data structures through ADT including stack.
3. Understand the basic operations of Queues.
4. Understand the basic concept of Tree and Graph and their operations.
5. Demonstrate and implement searching sorting algorithms.

List of Experiments:

1. To perform insertion and deletion operations on arrays.
2. To perform multiplication operations on matrix.
3. To implement a single linked list.
4. To implement a doubly linked list.
5. To calculate the factorial of a number using recursion.
6. To demonstrate static implementation of stack.
7. To demonstrate dynamic implementation of stack.
8. To demonstrate static implementation of Linear queue.
9. To demonstrate dynamic implementation of Linear queue.
10. To implement a circular queue.
11. To implement a binary search tree.
12. To perform BFS and DFS operations on graphs.
13. To perform binary search operations.
14. To perform sorting operations using bubble sort.
15. To perform sorting operations using insertion sort.

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PCC-LC-CL03 (P)	Object Oriented Programming & Methodology Lab	02P(2hrs.)	Credits:1
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Prerequisite: Programming for Problem Solving

Course Objectives:

This course is designed to provide knowledge of Object-Oriented Programming. It introduces object-oriented programming using the Java programming language. The course is designed to enhance the programming skills of the students by giving practical assignments to be done in labs. Its main objective is to teach the basic concepts and techniques of object-oriented programming paradigm. Students will learn how to program in Java and use some of its most important APIs.

Module 1:

Introduction to Object Oriented Programming, Basics of Java programming, Data types, Variables, Operators, Control structures, looping; Introduction to Java Development Kit (JDK)& Java virtual machine (JVM); Linker & Loader; Data Encapsulation: Concept of Classes & Objects.

Module 2:

Data Abstraction and Message Passing: Methods, constructors, Keywords: this, static; Access modifiers, Arrays within a class, String Class.

Module 3:

Relationship between classes: Inheritance, Types of Inheritance, Ambiguity in multiple inheritances, Concept of interfaces; Specialization- Association, Aggregation and Composition; Static and Dynamic Binding: Polymorphism, Method Overriding & Overloading; Keywords: super, abstract, final.

Module 4:

Concept of Packages, Need of package; Basic idea of exception handling, Exception types: Exception Handling Try, Catch, Finally, Throw statement, Assertions.

Module 5:

Overview of Simple threads, thread life cycle and methods, Runnable interface, Thread synchronization, Basic idea of Multithreaded Programming.

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Course Outcomes:

1. Understand object-oriented programming principles and apply them in solving problems.
2. Develop skill in data abstraction and message passing.
3. Understand fundamentals of relationship amongst objects.
4. Learn about the need for exceptions and errors.
5. Understand the concept of threads.

List of Experiments:

1. Write a program to demonstrate the concept of Class and Objects in Java.
2. Write a program to demonstrate Java data types, variables, operators, control structures, and looping statements.
3. Write a program to demonstrate Arrays in Java.
4. Write a program to demonstrate Methods and Constructors in Java.
5. Write a program to demonstrate the use of this, static, and access modifiers in Java.
6. Write a program to demonstrate commonly used operations of the String class in Java.
7. Write a program to demonstrate Inheritance in Java, including the use of the super keyword.
8. Write a program to demonstrate Polymorphism using Method Overloading and Method Overriding.
9. Write a program to demonstrate Interfaces and Abstract Classes in Java.
10. Write a program to demonstrate Association, Aggregation, and Composition between classes.
11. Write a program to demonstrate Exception Handling using try, catch, finally, and throw.
12. Write a program to create a user-defined Package and add a Class to the Package.
13. Write a program to demonstrate User-Defined Exceptions and Assertions in Java.
14. Write a program to demonstrate the Life Cycle of a Thread using the Thread class.
15. Write a program to demonstrate Multithreading using the Runnable interface and Thread Synchronization.

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Semester III

PCC-LC-CL04(P)	Artificial Intelligence Lab	02P(2hrs.)	Credits:1
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Prerequisite:

Course Objectives:

The objective of this laboratory is to provide hands-on experience in implementing Artificial Intelligence algorithms and intelligent applications using Python and modern AI libraries. Students will learn problem-solving, search techniques, machine learning basics, and introductory Generative AI tools.

Module 1 :

Foundations of AI, Intelligent Agents, Ethics, Python & Colab

Module 2 :

Problem Solving, State Space, BFS, DFS, UCS, Best First, A*

Module 3 :

Knowledge Representation, Logic, Rule-Based Systems, Expert Systems

Module 4 :

Game Playing, Minimax, Alpha-Beta Pruning, AI Case Study

Module 5 :

AI Applications, Computer Vision, Robotics, LLMs, Prompt Engineering, AI Assistants, Mini Project

Course Outcomes:

1. Develop AI applications using Python and standard AI libraries.
2. Implement classical search algorithms for intelligent problem solving.
3. Design simple expert systems and rule-based intelligent applications.
4. Build and evaluate basic machine learning models for real-world datasets.
5. Develop small AI projects using modern AI tools including introductory Generative AI.

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List of Experiments:

1. Install Python, Jupyter Notebook/Google Colab and write basic Python programs for AI applications.
2. Study and implement PEAS representation for real-world AI systems (Self-driving Car, Vacuum Cleaner, Medical Diagnosis, etc.).
3. Develop a simple rule-based AI application using Python (e.g., Student Career Advisor or Weather Recommendation System).
4. Implement Breadth First Search (BFS) and Depth First Search (DFS) algorithms using Python.
5. Implement Uniform Cost Search (UCS) and compare its performance with BFS and DFS.
6. Implement A* Search algorithm to find the shortest path in a map (GPS Route Planning).
7. Implement propositional logic using Python to evaluate logical expressions.
8. Develop a simple Forward Chaining and Backward Chaining inference system.
9. Design a rule-based Expert System for disease diagnosis or loan approval.
10. Implement the Minimax algorithm for Tic-Tac-Toe.
11. Implement Alpha-Beta Pruning and compare its efficiency with Minimax.
12. Simulate the Prisoner's Dilemma and analyze different game-playing strategies.
13. Write a program to solve the 5-queens problem.
14. Perform Prompt Engineering experiments using AI Assistants (ChatGPT/Gemini/Copilot) for text summarization, code generation, and question answering.
15. Mini Project: Develop a simple AI application (e.g., Chatbot, Movie Recommendation System, Face Detection, Handwritten Digit Recognition, or Student Performance Predictor).

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Semester III

PCC-LC-CL05(P)	Programming in Python	02P(2hrs.)	Credits:1
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Prerequisite:

Course Objectives:

The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language. Learning Outcomes: Problem solving and programming capability.

Module 1:

Introduction History, Features, Python –Environment Setup Local Environment Setup, Getting Python, Installation of Python, Use of IDE.

Module 2:

Python – Basic Syntax Python Identifiers, Reserved Words, Lines & Indentation, Multiline Statements, Quotation in Python, Comments & other useful constructs, Python –Variables Assigning Values to Variables, Multiple Assignment, Standard Data Types.

Module 3:

Python – Variables, Assigning Values to Variables, Multiple Assignment, Standard Data Types; Python Numbers, Python Strings, Python Lists, Python Tuples, Dictionary, Data Type Conversion.

Module 4:

Python– Basic Operators, Types of Operators, Arithmetic Operators, Comparison Operators, Assignment Operators, Bitwise Operators, Logical Operators, Operator Precedence, Python–Decision Making & Loops, Flowchart, If statement Syntax. Python - Functions, Syntax for defining a function, Calling a Function, Function Arguments, Anonymous Functions Python-Applications & Further Extensions, Data analysis packages.

Module 5:

Python File Operations: Reading files, Writing files in python, Understanding read functions, read(), readline(), readlines(). Understanding write functions, write() and writelines() Manipulating file pointer using seek Programming, using file operations. Database Programming: Connecting to a database, Creating Tables, INSERT, UPDATE, DELETE and READ operations, Transaction Control, Disconnecting from a database, and Exception Handling in Databases.

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Course Outcomes:

1. Install Python and have knowledge of the syntax of Python.
2. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python.
3. Express different Decision-Making statements and Functions.
4. Develop code in Python using functions, loops, etc.
5. Design GUI Applications in Python and evaluate different database operations.

List of Experiments:

1. Introduction to python programming and python data types.
2. Python program to find the union of two lists.
3. Python program to find the intersection of two lists.
4. Python program to remove the “i”th occurrence of the given word in a list where words repeat.
5. Python program to count the occurrences of each word in a given string sentence.
6. Python program to check if a substring is present in a given string.
7. Python program to map two lists into a dictionary.
8. Python program to count the frequency of words appearing in a string using a dictionary.
9. Python program to create a dictionary with key as first character and value as words starting with that character.
10. Python program to find the length of a list using recursion.
11. Python program to read a file and capitalize the first letter of every word in the file.
12. Python program to read the contents of a file in reverse order.