Lesson Plan:- Programming with Python (CSEPC 203 TH:2)

3rd Semester CSE- Winter 2025

Name of the Faculty-Mousumi Subudhi **Date-14th July 2025**

Unit I– Introduction to Python (8 Classes)	
1	Concept of python
2	Features and Applications of Python
3	Setting Up the Python Environment
4	Python Installation, IDEs
5	Python Syntax: Variables, Data Types
6	Operators Writing, Executing
7	Debugging Python Scripts
8	Simple Programs using variable, datatype in python
Unit II–Control Structures and Functions (8 Classes)	
9	Concept of Conditional Statements in python
10	if, else, elif syntax and use in programming
11	Loops: for, while, and Nested Loops
12	Programs practice using loops
13	Functions Defining, calling, Scope of Variables
14	Programs using function
15	Introduction to Lambda Functions
16	Recursion function
Unit III–Data Structures in Python: (8 Classes)	
17	Lists, Tuples, Sets
18	Programs using list
19	Tuple characteristics, creation, access tuple items
20	Examples on set in python
21	List Comprehensions and Dictionary Comprehensions Working with Strings

22	Methods and Manipulation,
23	Introduction to Python's Collections Module
24	Examples
Unit IV–File Handling and Modules (7 Classes)	
25	Concept of File, module
26	File Operations, Reading, Writing
27	Appending Files Working with CSV Files
28	Working with JSON Files
29	Python Modules Built-In Modules (e.g., math, os, datetime)
30	Creating and Using Custom Modules
31	Examples and Programs
Unit V– Object-Oriented Programming (OOP) in Python: (7 Classes)	
32	Understanding Classes and Objects
33	Concepts of Encapsulation
34	Programs using class, object in python
35	Concept of inheritance, Types of inheritance
36	Programs using inheritance
37	Polymorphism concept Operator Overloading
38	Exception Handling in Python
Unit VI–Advanced Python and Applications (7 Classes)	
39	Introduction to Libraries: NumPy, Pandas, Matplotlib
40	Programs using libraries
41	Basics of Web Scraping: Using requests,
42	BeautifulSoup
43	Scripting for Automation: Working with os
44	Mini-Project: Developing a Python Script for a Real-World Problem
45	Create python project

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BRANCH: CSE	SEMESTER: 3rd	NAME OF THE TEACHING FACULTY: **Mrs. MOUSUMI SUBUDHI**
SUBJECT: **DATA STRUCTURES**	NO.OF DAYS/PER WEEK CLASS ALLOTTED: **3**	SEMESTER FROM DATE: **14/07/2025** TO DATE: **15/11/2025** NO.OF WEEKS: **15**
WEEK	**CLASS DAY**	**THEORY/PRACTICAL TOPICS**
1st	1st	Introduction to Data Structures: Terminology & Need
	2nd	Classification of Data Structures: Linear Data structures
	3rd	Non-Linear Data structures
2nd	1st	Operations on Data Structures
	2nd	Algorithm Analysis: Time & Space Complexity
	3rd	Asymptotic Notations (Big O, Ω, Θ)
3rd	1st	Asymptotic Notations (Big O, Ω, Θ)
	2nd	Worst-case Analysis of Algorithms
	3rd	**Linear Data Structures:** Stacks-Introduction to Stacks, Array Representation of Stacks
4th	1st	Stack Operations (Push, Pop, Peek)
	2nd	Applications of Stacks: Infix to Postfix Transformation
	3rd	Evaluating Postfix Expressions.
5th	1st	Practice Problems on Stacks
	2nd	Introduction to Queues, Array Representation of Queues
	3rd	Queue Operations (Enqueue, Dequeue)
6th	1st	Types of Queues: DeQueue (Double-Ended Queue)
	2nd	Circular Queue
	3rd	Applications of Queues: Round Robin Scheduling
7th	1st	Introduction to Linked Lists, Singly Linked List
	2nd	Single linked list Representation in memory
	3rd	Operations on Single linked list-insertion at the beginning and at the end of the list
8th	1st	Operations on Single linked list-insertion w.r.t a particual node
	2nd	Operations on Single linked list-deletion at the beginning and at the end of the list
	3rd	Operations on Single linked list-deletion w.r.t a particual node
9th	1st	Circular Linked Lists
	2nd	Operations on Circular Linked Lists

9th	3rd	Doubly Linked Lists
10th	1st	Operations on Doubly Linked Lists
	2nd	Linked list representation and operations of stack
	3rd	Linked list representation and operations of stack
11th	1st	Linked list representation and operations of Queue
	2nd	Linked list representation and operations of Queue
	3rd	Trees: Basic Terminology & Structure
12th	1st	Binary Trees: Definition & concept
	2nd	Representation of Binary Trees (Array, Linked)
	3rd	Tree Operations: Insertion & Deletion
13th	1st	Tree Traversals: Inorder, Preorder
	2nd	Tree Traversals: Postorder
	3rd	Types of Binary Trees: BST, Complete, Full, Balanced etc.
14th	1st	Binary Search Tree: Insertion, Deletion
	2nd	BST Traversal & Search
	3rd	Introduction to Graphs: Terminology
15th	1st	Graph Representations: Set, Linked
	2nd	Graph Representations: Adjacency Matrix
	3rd	Graph Traversals: BFS
		Graph Traversals: DFS

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Lesson Plan – Algorithms (CSEPC 209/TH5)

3rd Semester Computer Science (Winter 2025)

Name of the Faculty-Yogeswari Magar **Date-14th July 2025**

Class No.	Topic
Unit I – Introduction to Algorithms (8 Classes)	
1	What is an Algorithm? Characteristics and Importance
2	Algorithm vs Program, Algorithm Writing Basics
3	Input/Output, Finiteness, Definiteness, Effectiveness
4	Writing Pseudocode: Format and Conventions
5	Examples: Simple Algorithms (Sum, Max-Min)
6	More Examples: Swapping, Factorial (Non-Recursive)
7	Dry Run and Step-by-Step Execution of Algorithms
8	Practice Exercises and Class Quiz
Unit II – Algorithmic Complexity (8 Classes)	
9	Concept of Time and Space Complexity
10	Best, Worst, and Average Case Analysis
11	Big-O, Big-Ω, Big-Θ Notations
12	Rules to Compute Time Complexity
13	Examples of Complexity Calculation
14	Analyzing Simple Search and Loop-based Algorithms
15	Exercises and Complexity Comparisons
16	Quiz + Discussion on Complexity Problems
Unit III – Recursive Algorithms (6 Classes)	
17	Concept of Recursion vs Iteration
18	Recursive Examples: Fibonacci, Factorial
19	Tower of Hanoi and Analysis
20	Complexity of Recursive Algorithms
21	Converting Recursion to Iteration
22	Practice Problems and Recap

Class No.	Topic
Unit IV – Algorithm Paradigms (8 Classes)	
23	Greedy Approach – Concept and Introduction
24	Examples: Coin Change, Activity Selection
25	Divide and Conquer – Concept & Merge Sort Example
26	Quicksort as Divide and Conquer
27	Dynamic Programming – Concept & Fibonacci/Knapsack
28	Backtracking – N-Queens/Subset Sum
29	Branch and Bound – Conceptual Overview
30	Revision and Comparison of Paradigms
Unit V – Sorting & Searching (8 Classes)	
31	Sorting Overview: Importance and Classification
32	Bubble Sort, Selection Sort
33	Insertion Sort, Comparison with Others
34	Merge Sort and Quicksort (Recap)
35	Heap Sort, Radix Sort Overview
36	Searching Techniques: Linear and Binary Search
37	Binary Search Tree and Balanced BST
38	Hashing and Hash Tables
Unit VI – Graph Algorithms (7 Classes)	
39	Introduction to Graphs: Directed/Undirected, Cycles
40	Graph Representations and Traversals
41	Topological Sorting
42	Minimum Spanning Tree: Kruskal's and Prim's Algorithm
43	Shortest Path: Dijkstra's Algorithm
44	Flow-Based Algorithms: Concept Overview
45	Final Review + Class Quiz

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Lesson plan of Winter-2025
(5TH SEMESTER CSE)

DISCIPLINE:CSE	SEMESTER:5TH	NAME OF THE TEACHING FACULTY: MR. PRABEEN KUMAR PATTNAIK
SUBJECT: Entrepreneurship and Management Technology	NO.OF DAYS/PER WEEK CLASS ALLOTTED : 4	SEMESTERFROMDATE: 14/07/2025 TO 15/11/2025 NO.OF WEEKS:15
WEEK	CLASS DAY	THEORY/PRACTICAL TOPICS
1ST	1ST	**Entrepreneurship** Concept /Meaning of Entrepreneurship
	2ND	Need of Entrepreneurship
	3RD	Characteristics, Qualities and Types of entrepreneur, Functions
	4TH	Barriers in entrepreneurship
2ND	1ST	Entrepreneurs vrs. Manager
	2ND	Forms of Business Ownership: Sole proprietorship, partnership forms and others
	3RD	Types of Industries, Concept of Start-ups
	4TH	Entrepreneurial support agencies at National, State, District Level(Sources): DIC, NSIC,OSIC, SIDBI, NABARD, Commercial Banks, KVIC etc.
3RD	1ST	Entrepreneurial support agencies at National, State, District Level(Sources): DIC, NSIC,OSIC, SIDBI, NABARD, Commercial Banks, KVIC etc.
	2ND	Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks
	3RD	**Market Survey and Opportunity Identification (Business Planning)** Business Planning
	4TH	SSI, Ancillary Units
4TH	1ST	Tiny Units, Service sector Units
	2ND	Time schedule Plan
	3RD	Agencies to be contacted for Project Implementation
	4TH	Assessment of Demand and supply and Potential areas of Growth
5TH	1ST	Identifying Business Opportunity
	2ND	Final Product selection
	3RD	**Project report Preparation** Preliminary project report
	4TH	Detailed project report
6TH	1ST	Techno economic Feasibility
	2ND	Project Viability
	3RD	**Management Principles**
		Definitions of management
	4TH	Principles of management
7TH	1ST	Functions of management (planning, organising, staffing, directing and controlling etc.)
	2ND	Functions of management (planning, organising, staffing, directing and controlling etc.)

	3RD	Level of Management in an Organization
	4TH	**Functional Areas of Management** a) Production management Functions, Activities
8TH	1ST	Productivity Quality control Production Planning and control
	2ND	b) Inventory Management Need for Inventory management
	3RD	Models/Techniques of Inventory management
	4TH	c) Financial Management Functions of Financial management Management of Working capital Costing (only concept)
9TH	1ST	Break even Analysis Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash book, P&L Accounts, Balance Sheets(only Concepts)
	2ND	d) Marketing Management Concept of Marketing and Marketing Management
	3RD	Marketing Techniques (only concepts) Concept of 4P s (Price, Place, Product, Promotion)
	4TH	e) Human Resource Management Functions of Personnel Management Manpower Planning, Recruitment,
10TH	1ST	*Sources of manpower, Selection process,* Method of Testing, Methods of Training & Development, Payment of Wages
	2ND	**Leadership and Motivation** a) Leadership Definition and Need/Importance
	3RD	Qualities and functions of a leader Manager Vs Leader
	4TH	Style of Leadership (Autocratic, Democratic, Participative)
11TH	1ST	b) Motivation Definition and characteristics Importance of motivation
	2ND	Factors affecting motivation Theories of motivation (Maslow) Methods of Improving Motivation
	3RD	Importance of Communication in Business
		Types and Barriers of Communication
	4TH	**Work Culture, TQM & Safety** Human relationship and Performance in Organization
12TH	1ST	Relations with Peers, Superiors and Subordinates
	2ND	*TQM concepts: Quality Policy, Quality Management,* Quality system
	3RD	Accidents and Safety, Cause, preventive measures
	4TH	General Safety Rules , Personal Protection Equipment(PPE)
13TH	1ST	**Legislation** a) Intellectual Property Rights(IPR),
	2ND	Patents, Trademarks, Copyrights
	3RD	b) Features of Factories Act 1948 with Amendment (only salient points)
	4TH	b) Features of Factories Act 1948 with Amendment (only salient points)

14TH	1ST	c) Features of Payment of Wages Act 1936 (only salient points)
	2ND	c) Features of Payment of Wages Act 1936 (only salient points)
	3RD	. **Smart Technology** Concept of IOT, How IOT works
	4TH	Components of IOT, Characteristics of IOT
15TH	1ST	Categories of IOT
	2ND	Applications of IOT- Smart Cities, Smart Transportation,
	3RD	Smart Home, Smart Healthcare, Smart Industry,
	4TH	Smart Agriculture, Smart Energy Management etc.

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DISCIPLINE:CSE	SEMESTER:5TH	NAME OF THE TEACHING FACULTY: MRS. MOUSUMI SUBUDHI
SUBJECT: Internet and Web Technology	NO.OF DAYS/PER WEEKCLASS ALLOTTED:4	SEMESTERFROMDATE: : 14/07/2025 TO 15/11/2025 NO.OF WEEKS:15
WEEK	CLASS DAY	THEORY/PRACTICAL TOPICS
1ST	1ST	**Internet Basics** Computer network
	2ND	Concept of Internet, Intranet
	3RD	*Modem*
	4TH	IP Address, Internet Domains
2ND	1ST	CIDR Notation, ISP
	2ND	TCP/IP
	3RD	**Internet Connectivity & WWW** Introduction to connectivity
	4TH	Medium and methods of connectivity, ISDN, VSAT, RF Link
3RD	1ST	Working of Internet
	2ND	Introduction to WWW
	3RD	Application Level Protocol
	4TH	*Web Browser, URL, Hyper text*
4TH	1ST	Hyperlinks, Hypermedia
	2ND	Search Engine, Proxy sever
	3RD	CGI, URI, Dreamweaver
	4TH	**Internet Security** Introduction to security
5TH	1ST	*Types of security*
	2ND	Authentication & Authorization
	3RD	Firewalls
	4TH	Encryption & Decryption
6TH	1ST	SSL
	2ND	***Internet Application*** E-Mail, Email protocols
	3RD	Telnet, FTP
	4TH	Newsgroup
7TH	1ST	Chartroom Internet Relay Chat
	2ND	*Video Conferencing*
	3RD	E-Commerce
	4TH	**Website Classifications** Static Websites
8TH	1ST	Dynamic websites Web portals
	2ND	Social Networking Sites RSS Feed, Blog, Netiquette
	3RD	**Development of Portals Using HTML** Design a webpage, Good Web Design
	4TH	HTML Introduction
9TH	1ST	HTML Tags, Anchor Tag

	2ND	Table Tag
	3RD	HTML Frames
	4TH	*Forms*
10TH	1ST	Disadvantages of HTML
	2ND	Separating style from structure with style sheets
	3RD	CSS Rules, Types of CSS
	4TH	**Client side Scripting with JavaScript**
		Introduction to script, Client side Scripting, Types of Scripting
11TH	1ST	Variables in JavaScript, Built-in Function Arrays in JavaScript, Conditional statements, Loops
	2ND	Document Object Model Creating Functions, objects in JavaScript
		Working with Cookies
	4TH	Connecting database using JavaScript in HTML Page
12TH	1ST	Working with Browser, validating and *submitting Forms*
	2ND	**Server Side Scripting** Introduction to server side Scripting
	3RD	Components of SSS Difference between CSS and SSS
	4TH	Server side Scripting method
13TH	1ST	*JavaScript on server*
	2ND	SQL
	3RD	**Server Side Programming using PHP** Introduction to PHP
	4TH	Variables, string
14TH	1ST	operator types
	2ND	operator types
	3RD	Conditional statement
	4TH	Loops
15TH	1ST	Array
	2ND	GET and POST Method
	3RD	GET and POST Method
	4TH	Sessions

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DISCIPLINE:CSE	SEMESTER:5TH	NAME OF THE TEACHING FACULTY: MRS. YOGESWARI MAGAR
SUBJECT: Software Engineering	NO.OF DAYS/PER WEEK CLASS ALLOTTED:4	SEMESTERFROMDATE:14/07/2025 TO DATE: 15/11/2025 NO.OF WEEKS:15
WEEK	CLASS DAY	THEORY/PRACTICAL TOPICS
1st	1st	1.1 Program vs. Software product 1.2Emergence of Software Engineering.
	2nd	Computer SystemsEngineering Software Life CycleModels
	3rd	1.4.1Classical Water fall model
	4th	1.4.2 Iterative Water fall model
2nd	1st	1.4.3Prototyping model
	2nd	Evolutionarymodel Spiralmodel
	3rd	Responsibility of Project Manager Project Planning
	4th	2.3 Metrics for Project size estimation(LOC and FP)
3rd	1st	2.4 Project Estimation Techniques
	2nd	2.5 COCOMO Models, Basic, Intermediate and complete
	3rd	2.5 COCOMO Models, Basic, Intermediate and complete
	4th	2.6 Scheduling
4th	1st	2.7 Organization and Team structure
	2nd	2.8 Staffing
	3rd	2.9 Risk Management
	4th	2.10 Configuration Management
5th	1st	Requirements gathering andanalysis Software RequirementsSpecification
	2nd	Software Requirements Specification Contents ofSRS
	3rd	3.2.2 Characteristics of Good SRS
	4th	3.2.3 Organization of SRS
6h	1st	3.2.4 Techniques for representing complexing logic
	2nd	3.2.4 Techniques for representing complexing logic
	3rd	What is a Good S/Wdesign Cohesion andcoupling
	4th	Neat arrangement S/W Designapproaches
7th	1st	Structuredanalysis Data Flow Diagrams
	2nd	Symbols used inDFD DesigningDFD
	3rd	4.9Developing DFD model of a system
	4th	4.10Shortcomings of DFD
8th	1st	4.11 Structured design
	2nd	4.12Principles of transformation of DFD to Structure Chart

	3rd	4.13Transform analysis and Transaction Analysis
	4th	4.14 Design Review
9th	1st	5.1 Characteristics of Good Interface
	2nd	5.2 Basic concepts of UID
	3rd	5.2 Basic concepts of UID
	4th	5.3Types of User interfaces
10th	1st	5.3Types of User interfaces
	2nd	5.4 Components based GUI development
	3rd	5.4 Components based GUI development
	4th	5.4 Components based GUI development
11th	1st	6.1 Coding 6.2.Code Review
	2nd	6.2.1 Code walk through
	3rd	6.2.2 Code inspections and software Documentation
	4th	Testing Unit testing
12th	1st	6.5 Black Box Testing
	2nd	6.6 Equivalence class partitioning and boundary value analysis
	3rd	6.7 White Box Testing
	4th	6.8Different White Box methodologies statement coverage branch coverage, condition coverage, path coverage,cyclomatic complexity data flow based testing and mutation testing
13th	1st	6.8Different White Box methodologies statement coverage branch coverage, condition coverage, path coverage,cyclomatic complexity data flow based testing and mutation testing
	2nd	Debuggingapproaches Debuggingguidelines
	3rd	6.11 Integration Testing
	4th	6.11 Integration Testing
14th	1st	7.1 Software Reliability
	2nd	7.2 Different reliability metrics
	3rd	7.2 Different reliability metrics
	4th	7.3 Reliability growth modeling
15th	1st	7.3 Reliability growth modeling
	2nd	7.4 Software quality
	3rd	7.4 Software quality
	4th	7.5 Software Quality Management System

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Lesson Plan:-C++ Programming (CSEPC 201/TH1)

3rd Semester CSE- Winter 2025

Name of the Faculty-Yogeswari Magar **Date-14th July2025**

Unit I – Introduction to C++ and Basic Programming (12 Classes)	
1	Introduction to Object-Oriented Programming: Features and Principles
2	User-defined Types: Structures and Unions
3	Concepts: Polymorphism and Encapsulation
4	Getting Started with C++: Syntax and Basic Program
5	Data Types, Variables, and Operators in C++
6	Control Structures: if, else, switch, loops
7	Functions: Syntax, Parameters, and Return Types
8	Functions with Default Arguments, Recursion
9	Namespaces and Scope Resolution
10	Strings and Character Arrays
11	One-dimensional and Two-dimensional Arrays
12	Pointers and Pointer Arithmetic
Unit II – Abstraction & Inheritance (11 Classes)	
13	Classes and Objects: Definitions, Access Specifiers
14	Constructors: Default, Parameterized
15	Destructors and Object Initialization
16	Member Functions, Inline Functions
17	Friend Functions and Static Members
18	References and Their Use
19	Inheritance: Basics and Types
20	Single and Multilevel Inheritance
21	Multiple and Hybrid Inheritance
22	Virtual Base Class and Constructor/Destructor Call Order
23	Derived Class Constructors and Base Initialization
Unit III – Polymorphism (9 Classes)	

24	Introduction to Polymorphism: Static vs Dynamic Binding
25	Function Overloading and Ambiguities
26	Base Class Pointer and Object Slicing
27	Late Binding and Method Overriding
28	Virtual Functions and Runtime Polymorphism
29	Pure Virtual Functions and Abstract Classes
30	Abstract Classes: Design and Usage
31	Polymorphism Examples and Applications
32	Recap and Quick Quiz on Polymorphism
Unit IV – Operator Overloading (9 Classes)	
33	Operator Functions: Syntax and Usage
34	This Pointer and Its Applications
35	Overloading Unary and Binary Operators
36	Member vs Non-member Operator Overloads
37	Overloading Assignment and Comparison Operators
38	Overloading I/O Operators (<<, >>)
39	Examples and Programs on Operator Overloading
40	Common Mistakes in Operator Overloading
41	Practice Exercises and Review
Unit V – Exception Handling (4 Classes)	
42	Basics: try, throw, catch
43	Exceptions with Classes and Inheritance
44	Function Exception Specification, unexpected()
45	Final Review + Unit V Exercises / MCQ Test

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