

Government Polytechnic, Balangir							
Department of Computer Science Engineering							
LESSON PLAN 2026-27(WINTER)							
NAME OF THE TEACHER : DEEPAK KUMAR BARDA, LECT.CSE(STAGE-II)							
Subject: PROGRAMMING WITH PYTHON (Course Code: CSEPC 203/TH2)							
Program: Diploma in Computer Science and Engineering							
Semester: 3rd							
Total Contact Hours: 45							
Total Marks: 100							
Assessment: Internal Assessment – 30, End Term – 70							
After completion of the course, the students will be able to:							
CO1: Define Python's core syntax, data types, and key concepts of object-oriented programming.							
CO2: Explain how control structures and data structures function in Python.							
CO3: Implement Python programs using file handling, modules, and libraries like NumPy, Pandas, and Matplotlib.							
CO4: Analyze Python scripts to identify and resolve logical or syntactic errors and optimize code.							
CO5: Develop a real-world mini-project by integrating Python concepts.							
Period	Unit	Topic / Sub-Topic	Learning Objectives (Bloom's Aligned)	Activity	Course Outcome	Learning Methodology	Homework
1	I	Overview of Python: Features and Applications PDF	Identify the key features and real-world applications of Python.	Interactive Q&A	CO1	Lecture & Discussion	Read textbook introduction on Python's history.
2	I	Setting Up the Python Environment (IDEs) PDF	Configure a local Python development environment.	Installation Walkthrough	CO1	Demonstration	Install VS Code/PyCharm on a personal machine.
3	I	Python Syntax & Variables PDF	Declare variables and apply standard Python naming conventions.	Code Tracing	CO1	Lecture & Coding	Write a basic "Hello World" with variables.
4	I	Data Types PDF	Differentiate between fundamental data types (int, float, str, bool).	Variable Type Exercises	CO1	Problem Solving	Practice type casting in a script.
5	I	Operators PDF	Apply arithmetic, relational, and logical operators.	Math Logic Puzzles	CO1	Demonstration	Write a script to calculate simple interest.
6	I	Writing and Executing Scripts PDF	Execute Python files via terminal or IDE.	Live Coding	CO1	Lecture & Coding	Create and run a multi-line output script.
7	I	Debugging Python Scripts PDF	Identify and resolve basic syntax errors. PDF	Error Hunt Game	CO4	Problem Solving	Fix a provided broken script.
8	I	Unit I Review & Practice	Consolidate Unit I syntax concepts.	Peer Code Review	CO1, CO4	Discussion	Review Unit I notes.

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9	II	Conditional Statements: if, else, elif PDF	Construct decision-making logic in scripts.	Flowchart Mapping	CO2	Lecture & Visuals	Write an even/odd number checker.
10	II	Conditional Statements Practice PDF	Solve problems using nested conditionals.	Coding Demo	CO2	Problem Solving	Write a grading system script based on marks.
11	II	Loops: for loops PDF	Implement definite iteration over sequences.	Sequence Tracing	CO2	Lecture & Coding	Print a multiplication table using a for loop.
12	II	Loops: while loops PDF	Implement indefinite iteration based on conditions.	Infinite Loop Debugging	CO2	Demonstration	Write a guessing game with a while loop.
13	II	Nested Loops PDF	Design multi-dimensional iterative patterns.	Pattern Printing	CO2	Problem Solving	Print a pyramid of stars.
14	II	Functions: Defining & Calling PDF	Create modular, reusable code blocks.	Code Refactoring	CO2	Lecture & Demo	Convert previous scripts into functions.
15	II	Scope of Variables & Lambda Functions PDF	Differentiate local/global scope and write anonymous functions.	Scope Mapping	CO2, CO4	Demonstration	Write a lambda function for square roots.
16	II	Recursion PDF	Trace and implement recursive function calls.	Call-stack Tracing	CO2, CO4	Lecture	Write a recursive factorial function.
17	III	Lists: Operations and Applications PDF	Perform CRUD operations on lists.	Memory Visual Drawing	CO2	Lecture & Demo	Create a dynamic shopping list script.
18	III	Tuples & Sets PDF	Contrast mutable lists with immutable tuples and unique sets.	Concept Comparison	CO2	Demonstration	Remove duplicates from a list using a set.
19	III	Dictionaries: Operations PDF	Map key-value pairs for structured data storage.	Coding Demo	CO2	Lecture & Coding	Build a basic student directory dictionary.
20	III	List & Dictionary Comprehensions PDF	Formulate concise single-line loops for data structures.	Syntax Conversion	CO2, CO4	Problem Solving	Refactor loops into comprehensions.
21	III	Working with Strings: Methods PDF	Utilize built-in string manipulation methods.	Code Implementation	CO2	Demonstration	Write a palindrome checker.

22	III	Working with Strings: Manipulation PDF	Format and slice complex strings.	Data Extraction	CO2	Problem Solving	Extract domain names from email strings.
23	III	Introduction to Collections Module PDF	Apply Counter, defaultdict, and namedtuple.	API Exploration	CO2	Lecture & Demo	Count word frequency in a paragraph.
24	III	Unit II & III Assessment	Evaluate knowledge of control and data structures.	Quiz / Live Test	CO2	Assessment	Prepare for next unit's file handling.
25	IV	File Operations: Reading Files PDF	Open and read text files safely.	I/O Demonstration	CO3	Lecture & Coding	Read and print contents of a .txt file.
26	IV	File Operations: Writing & Appending PDF	Generate output logs and append data.	Log Creation	CO3	Demonstration	Write user inputs to a log file.
27	IV	Working with CSV Files PDF	Parse and write tabular data using the csv module.	Data Import	CO3	Problem Solving	Calculate average marks from a CSV.
28	IV	Working with JSON Files PDF	Serialize and deserialize JSON structures.	API Data Simulation	CO3	Lecture & Demo	Convert a Python dictionary to a .json file.
29	IV	Built-In Modules (math, datetime) PDF	Import standard library modules for specific tasks.	Utility Coding	CO3	Demonstration	Calculate days until next birthday using datetime.
30	IV	Built-In Modules (os) PDF	Interact with the operating system filesystem.	Directory Navigation	CO3	Lecture	Write a script to list all files in a folder.
31	IV	Creating Custom Modules PDF	Structure projects across multiple Python files.	Project Organization	CO3	Problem Solving	Create a custom calculator.py module and import it.
32	V	OOP: Classes and Objects PDF	Define class blueprints and instantiate objects. PDF	Class Design Exercise	CO1	Lecture & Demo	Design a Car class with attributes.
33	V	Encapsulation PDF	Protect object data using private attributes/methods.	Access Modifier Demo	CO1, CO5	Demonstration	Implement getter/setter methods.
34	V	Inheritance PDF	Reuse code via parent-child class relationships.	Hierarchy Drawing	CO1, CO5	Lecture & Coding	Create an Employee base class and Manager child class.

35	V	Polymorphism & Operator Overloading PDF	Implement method overriding and custom operator behavior.	Code Implementation	CO1, CO5	Demonstration	Overload the + operator for a custom object.
36	V	Magic Methods PDF	Utilize __init__, __str__, etc.	Syntax Review	CO1	Problem Solving	Format object string representation.
37	V	Exception Handling PDF	Catch runtime errors using try/except blocks.	Error Simulation	CO4	Lecture & Demo	Handle ZeroDivisionErr or gracefully.
38	V	Advanced Exception Handling PDF	Utilize finally and custom exceptions.	Code Hardening	CO4	Demonstration	Ensure a file closes even if an error occurs.
39	VI	Intro to Libraries: NumPy PDF	Perform array-based numerical operations.	Matrix Operations	CO3	Lecture & Coding	Create and multiply 2D arrays.
40	VI	Intro to Libraries: Pandas PDF	Manipulate Series and DataFrames for analysis.	Data Filtering	CO3	Demonstration	Load a CSV into a DataFrame and filter rows.
41	VI	Intro to Libraries: Matplotlib PDF	Generate basic plots and charts.	Data Visualization	CO3	Lecture & Demo	Plot a line graph of monthly temperatures.
42	VI	Basics of Web Scraping (requests, BeautifulSoup) PDF	Extract static HTML data from a webpage.	Live Scraping	CO3	Demonstration	Scrape article titles from a sample blog.
43	VI	Scripting for Automation (os, shutil) PDF	Automate file system tasks (moving/copying).	Bulk File Organizer	CO3, CO5	Problem Solving	Write a script to organize downloads by extension.
44	VI	Mini-Project: Development PDF	Integrate concepts into a real-world script. PDF	Project Workshop	CO5	Project-Based	Finalize mini-project logic.
45	VI	Mini-Project: Presentation & Review	Evaluate code quality, error handling, and output.	Code Walkthrough	CO1-CO5	Peer Review	Prepare for the End Term Exam.

Deepak Kumar Barch
25.06.2026
Signature of Teacher

Deepak Kumar Barch
25.06.2026
Signature of HOD