Ganpat University
॥ विद्यया समाजोत्कर्षः ॥
Faculty of Computer Applications

Programme	B. Sc. (Hons.) IT (Cyber Security)	**Branch**	Computer Applications
Semester	VI	**Version**	1.0.0.0
Effective from Academic Year	2026-27	**Effective for the batch Admitted in**	June 2024
Subject code	U66A2PP2	**Subject Name**	PYTHON PROGRAMMING - II

Teaching scheme						**Examination scheme(Marks)**			
(Per week)	**Lecture (DT)**		**Practical (Lab.)**		**Total**		**CCE**	**SEE**	**Total**
	L	TU	P	TW					
Credit	2	-	2	-	4	Theory	50	50	100
Hours	2	-	4	-	6				

Objective:

To develop proficiency in object-oriented programming, data handling, and visualization techniques using Python.

Pre-requisites:

Basic understanding of programming concepts and logical reasoning.

Learning Outcome:

Name of CO	Description
CO1	Apply basic object-oriented programming concepts for structured Python development.
CO2	Implement core OOP features and handle exceptions effectively in Python programs.
CO3	Utilize NumPy for efficient numerical computing and data manipulation in Python.
CO4	Apply Pandas for effective data handling, transformation, and analysis in Python.
CO5	Use Python to perform basic log analysis and security automation tasks.

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	1	2	1	2	1	1	1	1
CO2	3	2	2	2	1	2	1	2	1	1	1	1
CO3	3	3	3	3	3	3	3	3	2	1	1	1
CO4	3	3	3	3	3	3	3	3	2	1	1	1
CO5	2	2	2	1	2	3	1	2	1	1	1	1

Content:

Unit	Content	Hrs.
1	**Introduction to Object-Oriented Programming (OOP Basics):** Need for Object-Oriented Programming, Comparison between Procedural and Object-Oriented Paradigms, Defining Classes and Creating Objects, The _init_() Constructor, Instance Variables and Methods, Class Variables and Static Methods, Method Overloading using Default Arguments, Access Modifiers, Understanding the self Keyword and Object Reference	06
2	**OOP Features and Exception Handling:** Inheritance Types, Method Overriding and use of super() Keyword, Basics of Polymorphism, Concept of Encapsulation and Data Hiding, Abstraction using Classes and Methods, Exception Handling Concepts, Difference between Syntax and Runtime Errors, Creating User-defined Exception Classes	06
3	**NumPy – Numerical Computing:** Introduction to NumPy Arrays – Creation and Types, Array Indexing, Slicing, and Reshaping, Arithmetic and Statistical Operations, Broadcasting and Aggregation Techniques, Performance Comparison between NumPy Arrays and Python Lists	06
4	**Pandas – Data Handling:** Introduction to Pandas Series and DataFrame, Data Import and Export using CSV and Excel Files, Data Cleaning and Handling Missing Values, Data Sorting, Filtering, and Grouping, Merging and Joining DataFrames	06

5	**Threat Detection and Security Automation with Python:** Log File Analysis, Suspicious Activity Detection, Pattern Matching using Regular Expressions, Basic Network Scanning, Ping and Port Scan Automation, Running Security Commands via Python Scripts, Generating Alerts and Reports	06

Practical Content:	
List of programs specify by subject teacher based on above mention topics.	
Reference Books:	
1	Introduction to Computation and Programming Using Python by John V. Guttag (3rd Edition) MIT Press
2	Python for Data Analysis by Wes McKinney (2nd Edition), O'Reilly Media
3	Data Structures and Algorithmic Thinking with Python by Narasimha Karumanchi (1st Edition) CareerMonk Publications
Web Reference:	
1	https://www.w3schools.com/python/
2	https://www.tpointtech.com/python-tutorial
3	https://www.geeksforgeeks.org/python/python-programming-language-tutorial/
MOOC/Certificate Course:	
1	https://www.coursera.org/learn/object-oriented-python
2	https://nptel.ac.in/courses/106106145
3	https://www.udemy.com/course/object-oriented-python-programming/?srsltid=AfmBOorYT_c9GMnLjhhhnHmdIIWDqs_Y5SClOXeWV8XggzvbYgdjAP1O
Question Paper Scheme:	
	End Semester Examination Duration: (2 Hours Theory Examination) **Note for Examiner: -** Q-1 Any Five out of Seven (25 Marks) Q-2 Any Two out of Three (06 Marks) Q-3 Mandatory question (05 Marks) Q-4 Any Two out of Three (08 Marks) Q-5 Any Two out of Three(06 Marks) *The question paper must comprehensively address all Course Outcomes (COs), align with Bloom's Taxonomy levels, and ensure complete syllabus coverage.