

<b>Programme</b>	B. Sc. (CA & IT) Honours				<b>Branch</b>	Computer Applications			
<b>Semester</b>	VI				<b>Version</b>	1.0.0.0			
<b>Effective from Academic Year</b>			2026-27		<b>Effective for the batch Admitted in</b>			June 2024	
<b>Subject code</b>	U16A1PT		<b>Subject Name</b>		PYTHON PROGRAMMING				
<b>Teaching scheme</b>					<b>Examination scheme(Marks)</b>				
<b>(Per week)</b>	<b>Lecture (DT)</b>		<b>Practical (Lab.)</b>		<b>Total</b>		<b>CCE</b>	<b>SEE</b>	<b>Total</b>
	L	TU	P	TW					
Credit	2	-	2	-	4	Theory	50	50	100
Hours	2	-	4	-	6				

**Objective:**

To develop foundational proficiency in Python programming with emphasis on problem-solving, data manipulation, and visualization for analytical applications.

**Pre-requisites:**

Fundamental knowledge of programming principles.

**Learning Outcome:**

Name of CO	Description
CO1	Gain familiarity with the Python language and its programming environment.
CO2	Understand and apply Python control structures for decision-making and iteration.
CO3	Develop proficiency in using Python collections for efficient data handling and manipulation.
CO4	Apply NumPy and Pandas for efficient numerical computation and data manipulation.
CO5	Create and customize data visualizations for effective data analysis and presentation.

**Mapping of CO and PO:**

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

**Content:**

Unit	Content	Hrs.
1	<b>Introduction to Python Programming:</b> History of Python, Features and Applications, Python Syntax and Indentation, Variables, Data Types, Comments, Literals, Input and Output functions, Strings and Characters, Type casting, Operators – Arithmetic, Comparison, Assignment, Logical, Bitwise, Membership and Identity	06
2	<b>Python Control Structures:</b> Decision Making Statements – If Statement, If else, Nested If, elif Statement Looping Statements – While loop, For loop, Nested loops Loop Control Statements – Break, Continue, Pass	06
3	<b>Python Collections:</b> List - List Indexing and Slicing, Traversing Lists, List Methods, List Membership, List Comprehensions Tuple - Creating and Accessing Tuples, Tuple Immutability, Tuples vs Lists Dictionary - Creating and Accessing Dictionary Elements, Dictionary Methods	06

	Set - Creating Sets and Set Literals, Set Operations, Set Methods	
4	<b>Efficient Data Analysis using NumPy and Pandas:</b> Introduction to NumPy Arrays – Creation and Types, Array Indexing, Slicing, and Reshaping, Arithmetic and Statistical Operations, 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	06
5	<b>Data Visualization with Matplotlib and Seaborn:</b> Introduction to Data Visualization and Its Importance, Plotting with Matplotlib – Line Chart, Bar Chart, Pie Chart, Histogram, and Subplots, Customizing Plots Data Visualization with Seaborn – Distribution Plots (distplot, histplot, kdeplot), Relationship Plots (scatterplot, lineplot), Categorical Plots (boxplot, barplot), Heatmaps and Pairplots for Multivariate Analysis, Saving and Exporting Charts in Various Formats	06
<b>Practical Content:</b>		
List of programs specify by subject teacher based on above mention topics.		
<b>Reference Books:</b>		
1	Introduction to Computation and Programming Using Python by John V. Guttag (3rd Edition) MIT Press	
2	Core Python Programming by R. Nageswara Rao (2nd Edition) Dreamtech Press	
3	Data Structures and Algorithmic Thinking with Python by Narasimha Karumanchi (1st Edition) CareerMonk Publications	
<b>Web Reference:</b>		
1	<a href="https://www.w3schools.com/python/">https://www.w3schools.com/python/</a>	
2	<a href="https://www.tpointtech.com/python-tutorial">https://www.tpointtech.com/python-tutorial</a>	
3	<a href="https://www.geeksforgeeks.org/python/python-programming-language-tutorial/">https://www.geeksforgeeks.org/python/python-programming-language-tutorial/</a>	
<b>MOOC/Certificate Course:</b>		
1	<a href="https://in.coursera.org/learn/python-programming-intro">https://in.coursera.org/learn/python-programming-intro</a>	
2	<a href="https://nptel.ac.in/courses/106106145">https://nptel.ac.in/courses/106106145</a>	
3	<a href="https://www.edx.org/learn/python/ibm-python-basics-for-data-science">https://www.edx.org/learn/python/ibm-python-basics-for-data-science</a>	
<b>Question Paper Scheme:</b>		
	<b>End Semester Examination Duration:</b> (2 Hours Theory Examination)	
	<b>Note for Examiner: -</b> 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.	