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SARVAJANIK UNIVERSITY

SARVAJANIK COLLEGE OF ENGINEERING AND TECHNOLOGY

BACHELOR OF TECHNOLOGY

B.Tech	1	Semester	1/2	Teaching Scheme				Evaluation Scheme	
Subject Name	Python Programming			**L**	**T**	**P**	**Credits**	**CCE**	**SEE**
Subject Code	BTCO22101			**2**	-	-	2	50	50
Type of course	Engineering Science Course			CCE : Continuous and Comprehensive Evaluation SEE : Semester End Evaluation					
Prerequisite	No prerequisite								
Rationale	Python is a versatile beginner-friendly programming language. This syllabus provides a comprehensive introduction to Python, covering its history, key features, and applications. It builds a strong foundation by covering basic syntax, data types, control flow, functions, and essential libraries like NumPy, Pandas, and Matplotlib. Additionally, it introduces object-oriented programming concepts, making it suitable for both beginners and those looking to enhance their Python skills for data manipulation and automation. Its demand in academia and industry makes it an essential skill for programmers and researchers alike.								

Course Outcomes (COs): At the end of the course, students will be able to		Marks % Weightage
CO – 1	Identify the fundamental concepts of Python programming	10
CO – 2	Define the role of control flow statements and functions	30
CO – 3	Understand built-in data structures such as arrays, lists, tuples, dictionaries, and sets.	35
CO – 4	List object-oriented programming principles in Python.	15
CO – 5	Recognize Python libraries such as NumPy, Pandas, and Matplotlib and their applications.	10

Course Contents

Unit	Content	Tentative Teaching Hours	Tentative Unit % Weightage
1	**Introduction to Python:** History, Features, Applications. Python Installation, IDEs, Basic Syntax, Variables, Input and output statement, Data Types: Built-in datatypes, Boolean, Sequence, Sets, Literals, Operators in Python: Arithmetic, Assignment, Unary, Logical, Relational, Bitwise, Membership, Identity.	2	7
2	**Control Flow:**	4	14

	Conditional Statements: if, if else, if... elif Loops (for, while), Nested Loop, else suite and Control Statements (break, continue, pass), Assertion statement in python, Generating Random Numbers.		
3	**Functions:** Defining Functions, Docstrings, Formal and Actual Arguments, Positional arguments, keyword arguments, default arguments, variable length arguments, local and global variables, Return, Returning Multiple values, Scope of a Variable, Recursive functions, Lambda Function.	6	20
4	**Arrays in Python:** Arrays using NumPy: Operations on Array, Creating arrays using functions: arrange(), linspace(), logspace(), zeroes(), ones(), Copying array, Dimensions of array, Attributes of array: ndim, shape, size, dtype. Indexing, Slicing, Broadcasting, Axis specific operations, Types of arrays, Matrices in Numpy, Random Numbers.	5	16
5	**Lists, Tuples, Dictionaries and Strings:** **Lists:** add, remove, replace items from a list. **Tuples:** Creating tuples, accessing tuple elements, basic operations on tuples, function to Insert, delete, and update operation on tuples, Nested Tuples. **Dictionaries:** Operations on Dictionaries, using for loop with dictionary, converting list to dictionary, converting string to dictionary. **Strings:** Creating, Indexing, slicing, repeating, concentration, Checking membership, comparing, finding substring, Replacing, splitting, Joining, searching.	6	20
6	**Classes and Object-Oriented Programming:** Objects, Classes, The Self Variable, Constructor, Types of Variables, Namespaces, Types of Methods: Instance Methods, Class Methods, Static Methods. Inheritance.	4	14
7	**Python libraries:** Pandas - Reading and Writing Files, Working with Text files and CSV Files, Matplotlib - line plot, scatter plot, bar chart, histogram.	3	9

Suggested Specification table with Marks

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
35	35	30	0	0	0

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

Recommended Reference Books

1 Dr. R. Nageshwar Rao., Core Python Programming, DreamTech, Second Edition, 2018.

2 Kenneth A. Lambert, Fundamentals of Python- First Programs, CENGAGE Publication, Second Edition, 2019.

CO-PO-Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO – 1	1	1	1	1	1	-	-	-	-	1	-	2
CO – 2	1	1	1	1	1	-	-	-	-	1	-	2
CO – 3	2	1	2	1	1	-	-	-	-	1	-	2
CO – 4	2	1	2	1	1	-	-	-	-	1	-	2
CO – 5	2	1	2	2	2	-	-	-	-	1	1	2

List of Open Source/learning website/Other Details if any:

1. https://onlinecourses.nptel.ac.in/noc24_cs57/preview

List of Open Source/learning website/Other Details if any:

1. Geany Editor
2. Jupyter Notebook
3. Anaconda
4. PyCharm