MOHAMMED SATHAK A J COLLEGE OF ENGINEERING

Siruseri IT park, OMR, Chennai - 603103

LESSON PLAN

DEPARTMENT OF INFORMATION TECHNOLOGY

Name of the Subject	PROBLEM SOLVING AND PYTHON PROGRAMMING	**Name of the handling Faculty**	Mr. S.Ashok Kumar
Subject Code	GE3151	**Year / Sem**	I/I
Acad Year	2022-2023	**Batch**	2022-2026

Course Objective

1. To know the basics of algorithmic problem solving
2. To read and write simple Python programs
3. To define Python functions and use function calls to solve problems
4. To define Python functions and call them
5. To use Python data structures - lists, tuples, dictionaries to represent complex data
6. To do input/output with files in Python

Course Outcome

Upon completion of the course, the students will be able to:

1.Develop algorithmic solutions to simple computational problems.
2.Develop and execute simple Python programs
3.Write simple Python programs using conditionals and loops for solving problems
4.Represent compound data using Python lists, tuples, dictionaries.
5.Read and write data from/to files in Python Programs.

Sl. No.	Topic(s)	T / R* Book	Periods Required	Mode of Teaching (BB / PPT / NPTEL / MOOC / etc)	Blooms Level (L1-L6)	CO	PO
UNIT-I	**ALGORITHMIC PROBLEM SOLVING**						
1	Fundamentals of Computing, Identification of Computational Problems	T1	1	BB	L1	CO1	PO1-PO3
2	Algorithms, Building blocks of algorithms	T1	1	BB	L2	CO1	PO1-PO2
3	Notation	T1	1	BB	L2	CO1	PO1
4	Algorithmic problem solving	T1	1	BB	L3	CO1	PO1-PO4
5	Simple strategies for developing algorithms	T1	1	BB	L3	CO1	PO1-PO3
6	find minimum in a list	T1	1	BB	L3	CO1	PO3
7	insert a card in a list of sorted cards	T1	1	BB	L3	CO1	PO3
8	guess an integer number in a range	T1	1	BB	L3	CO1	PO1-PO3
9	Towers of Hanoi	T1	1	BB	L3	CO1	PO1-PO3
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
Evaluation method							
UNIT II	**DATA, EXPRESSIONS, STATEMENTS**						
10	Python interpreter and interactive mode	T1	1	BB	L2	CO2	PO1-PO3
11	values and types: int, float, boolean, string, and list	T1	1	BB	L2	CO2	PO1-PO3
12	variables, expressions	T1	1	BB	L2	CO2	PO1-PO3
13	statements, tuple assignment	T1	1	BB	L2	CO2	PO1-PO3
14	precedence of operators	T1	1	BB	L2	CO2	PO1-PO3
15	comments; modules and functions	T1	1	BB	L2	CO2	PO1-PO3
16	function definition and use, flow of execution, parameters and arguments	T1	1	BB	L2	CO2	PO1-PO3
17	exchange the values of two variables, circulate the values of n variables	T1	1	BB	L3	CO2	PO1-PO3
18	distance between two points	T1	1	BB	L3	CO2	PO1-PO3
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
Evaluation method							
UNIT III	**CONTROL FLOW, FUNCTIONS**						
19	Conditionals: Boolean values and operators	T1	1	BB	L2	CO3	PO1-PO3
20	conditional (if), alternative (if-else), chained conditional (if-elif-else)	T1	1	BB	L2	CO3	PO1-PO3
21	Iteration: state, while, for, break, continue, pass	T1	1	BB	L2	CO3	PO1-PO3
22	Fruitful functions: return values	T1, R1	1	BB	L2	CO3	PO1-PO3
23	parameters, local and global scope	T1,R1	1	BB	L2	CO3	PO1-PO3
24	function composition, recursion	T1,R1	1	BB	L2	CO3	PO1-PO3
25	Strings: string slices, immutability,string functions and methods	T1,R1	1	BB	L2	CO3	PO1-PO3

Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
Evaluation method							
UNIT IV	**LISTS, TUPLES, DICTIONARIES**						
28	Lists: list operations, list slices, list methods	T1	1	BB	L2	CO4	PO1-PO3
29	list loop, mutability, aliasing, cloning lists, list parameters	T1	1	BB	L2	CO4	PO1-PO3
30	Tuples: tuple assignment	T1	1	BB	L2	CO4	PO1-PO3
31	tuple as return value	T1	1	BB	L2	CO4	PO1-PO3
32	Dictionaries: operations and methods	T1	1	BB	L3	CO4	PO1-PO3
33	advanced list processing	T1	1	BB	L3	CO4	PO1-PO4
34	list comprehension	T1	1	BB	L3	CO4	PO1-PO4
35	mergesort, histogram	T1	1	BB	L3	CO4	PO1-PO4
36	selection sort, insertion sort	T1	1	BB	L3	CO4	PO1-PO4
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
Evaluation method							
UNIT V	**FILES, MODULES, PACKAGES**						
37	Files and exception	T1	1	BB	L2	CO5	PO1-PO3
38	text files, reading and writing files	R1	1	BB	L2	CO5	PO1-PO3
39	format operator	T1	1	BB	L2	CO5	PO1-PO3
40	command line arguments	T1	1	BB	L2	CO5	PO1-PO3
41	errors and exceptions, handling exceptions	R1	1	BB	L2	CO5	PO1-PO3
42	modules	T1, R1	1	BB	L4	CO5	PO1-PO4
43	packages	T1,R1	1	BB	L4	CO5	PO1-PO4
44	word count	R1	1	BB	L3	CO5	PO1-PO4
45	copy file	R1	1	BB	L3	CO5	PO1-PO3
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
Evaluation method							
Content Beyond the Syllabus Planned							
	Plan to give the assignment : 1.Sample Programs for every topic 2.Develop Modules						

Text Books	
1	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist‘‘, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers, 2016
2	Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

Reference Books	
1	John V Guttag, —Introduction to Computation and Programming Using Python‘‘, Revised and expanded Edition, MIT Press , 2013
2	Robert Sedgewick, Kevin Wayne, Robert Dondero, —Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
3	Timothy A. Budd, —Exploring Python‖, Mc-Graw Hill Education (India) Private Ltd.,, 2015.
4	Kenneth A. Lambert, —Fundamentals of Python: First Programs‖, CENGAGE Learning, 2012.
5	Charles Dierbach, —Introduction to Computer Science using Python: A Computational Problem- Solving Focus, Wiley India Edition, 2013.
6	Paul Gries, Jennifer Campbell and Jason Montojo, —Practical Programming: An Introduction to Computer Science using Python 3‖, Second edition,
7	http://nptel.ac.in/

Website / URL References	
1	https://www.geeksforgeeks.org/Python-tutorials

Blooms Level

Level 1 (L1) : Remembering	Lower Order Thinking	Fixed Hour Exams	**Level 4 (L4) : Analysing**	Lower Order Thinking	Higher Order Thinking	Projects / Mini Projects
Level 2 (L2) : Understanding			**Level 5 (L5) : Evaluating**			
Level 3 (L3) : Applying			**Level 6 (L6) : Creating**			

Mapping syllabus with Bloom's Taxonomy LOT and HOT

Unit No	Unit Name	L1	L2	L3	L4	L5	L6	LOT	HOT	Total
Unit 1	ALGORITHMIC PROBLEM SOLVING	1	2	6	0	0	0	9	0	9
Unit 2	DATA, EXPRESSIONS, STATEMENTS	0	7	2	0	0	0	9	0	9
Unit 3	CONTROL FLOW, FUNCTIONS	0	7	2	0	0	0	9	0	9
Unit 4	LISTS, TUPLES, DICTIONARIES	0	4	5	0	0	0	9	0	9
Unit 5	FILES, MODULES, PACKAGES	0	5	2	2	0	0	7	2	9
Total		1	25	17	2	0	0	43	2	45
Total Percentage		2.22	55.56	37.78	4.44	0.00	0.00	95.56	4.44	100

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	2	0	0	2	0	0	0	0	3	2
CO2	3	3	3	2	2	0	0	2	0	0	0	0	3	2
CO3	3	3	3	2	2	0	0	2	0	0	0	0	3	2
CO4	3	3	3	3	2	0	0	2	2	0	0	0	3	2
CO5	3	3	3	3	2	0	0	2	2	0	0	0	3	2
Avg	3	3	3	2	2	0	0	2		0	0	0	3	2

Justification for CO-PO mapping

CO1	How to solve the Problems and identify solutions for that problems (Engg.Knowledge, Analysis,Design)
CO2	Basic Programming Knowledge (Engg.Knowledge, Analysis)
CO3	They Develop their own user defined funtions(Engg.Knowledge, Analysis,Design)
CO4	How to sort Real time datas using sorting techniques (Engg.Knowledge, Analysis,Design)
CO5	Create their own Modules (Engg.Knowledge, Analysis,Design)

3	High level	2	Moderate level	1	Low level

Name & Sign of Subject Expert : ASHOK KUMAR S

Head of the Department :CSE