

MOHAMMED SATHAK A J COLLEGE OF ENGINEERING

Siruseri IT park, OMR, Chennai - 603103

LESSON PLAN							
DEPARTMENT OF INFORMATION TECHNOLOGY & CSE							
Name of the Subject	PROBLEM SOLVING AND PYTHON PROGRAMMING	Name of the handling	Mr. S.Senthil Pandi,Mr.Muthu Kumar,Ms.Kiruthika				
Subject Code	GE3151	Year / Sem	I/I				
Acad Year	2021-2022	Batch	2021-2025				
Course Objective							
• To understand the basics of algorithmic problem solving							
• To learn to solve problems using Python conditionals and loops							
• To define Python functions and use function calls to solve problems							
• To use Python data structures - lists, tuples, dictionaries to represent complex data							
• 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.Read, write, execute by hand simple Python programs.							
3.Decompose a Python program into functions.							
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	Blooms Level (L1-L6)	CO	PO
UNIT-I COMPUTATIONAL THINKING AND PROBLEM SOLVING							
1	Fundamentals of Computing	T1	1	BB	L1	CO1	PO1-PO3
2	Identification of Computational Problems	T1	1	BB	L1	CO1	PO1-PO3
3	Algorithms	T1	1	PPT	L1	CO1	PO1-PO3
4	Building blocks of algorithms	T1	1	BB	L2	CO1	PO1-PO2
5	Notation	T1	1	BB	L2	CO1	PO1
6	Flow chart	T1	1	BB	L2	CO1	PO1
7	Algorithmic problem solving	T1	1	BB	L3	CO1	PO1-PO4
8	Simple strategies for developing algorithms	T1	1	BB	L3	CO1	PO1-PO3
9	Find minimum in a list	T1	1	PPT	L3	CO1	PO3
10	Insert a card in a list of sorted cards	T1	1	BB	L3	CO1	PO3
11	Guess an integer number in a range	T1	1	PPT	L3	CO1	PO1-PO3
12	Towers of Hanoi	T1	1	PPT	L3	CO1	PO1-PO3
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
Evaluation method : Assignment							
UNIT II DATA TYPES, EXPRESSIONS, STATEMENTS							
13	Python interpreter and interactive mode	T1	1	BB	L2	CO2	PO1-PO3
14	Interactive Mode	T1	1	BB	L2	CO2	PO1-PO3
15	Values and types: int, float, boolean	T1	1	PPT	L2	CO2	PO1-PO3
16	String, and list	T1	1	BB	L2	CO2	PO1-PO3
17	Variables, expressions	T1	1	BB	L2	CO2	PO1-PO3
18	Operators	T1	1	BB	L2	CO2	PO1-PO3
19	Statements, tuple assignment	T1	1	BB	L2	CO2	PO1-PO3
20	Precedence of operators	T1	1	BB	L2	CO2	PO1-PO3
21	Comments	T1	1	BB	L2	CO2	PO1-PO3
22	Exchange the values of two variables	T1	1	BB	L2	CO2	PO1-PO3
23	Circulate the values of n variables	T1	1	PPT	L3	CO2	PO1-PO3
24	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 : Quiz							
UNIT III CONTROL FLOW, FUNCTIONS, STRINGS							
25	Conditionals: Boolean values and operators	T1	1	BB	L2	CO3	PO1-PO3
26	Conditional (if), alternative (if-else),	T1	1	BB	L2	CO3	PO1-PO3
27	Chained conditional (if-elif-else)	T1	1	PPT	L2	CO3	PO1-PO3

28	Iteration: state, while, for	T1	1	BB	L2	CO3	PO1-PO3
29	break, continue, pass	T1	1	BB	L2	CO3	PO1-PO3
30	Fruitful functions: return values	T1, R1	1	PPT	L2	CO3	PO1-PO3
31	Parameters, local and global scope	T1,R1	1	BB	L2	CO3	PO1-PO3
32	Function composition, recursion	T1,R1	1	PPT	L2	CO3	PO1-PO3
33	Strings: string slices, immutability,string functions and methods	T1,R1	1	BB	L2	CO3	PO1-PO3
34	String module; Lists as arrays,square root, gcd, exponentiation	T1	1	PPT	L3	CO3	PO1-PO3
35	Sum an array of numbers	T1	1	BB	L3	CO3	PO1-PO3
36	linear search, binary search.	T1	1	BB	L3	CO3	PO1-PO3
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
Evaluation method :Tutorials							
UNIT IV LISTS, TUPLES, DICTIONARIES							
37	Lists: list operations,	T1	1	PPT	L2	CO4	PO1-PO3
38	list slices, list methods	T1	1	PPT	L2	CO4	PO1-PO3
39	aliasing, cloning lists	T1	1	PPT	L2	CO4	PO1-PO3
40	List loop, mutability, list parameters	T1	1	PPT	L2	CO4	PO1-PO3
41	Tuples: tuple assignment	T1	1	PPT	L2	CO4	PO1-PO3
42	Tuple as return value	T1	1	PPT	L2	CO4	PO1-PO3
43	Dictionaries: operations and methods	T1	1	PPT	L3	CO4	PO1-PO3
44	Advanced list processing	T1	1	PPT	L3	CO4	PO1-PO4
45	List comprehension	T1	1	PPT	L3	CO4	PO1-PO4
46	Simple Sorting,Histogram	T1	1	PPT	L3	CO4	PO1-PO4
47	Students marks statement	T1	1	PPT	L2	CO4	PO1-PO3
48	Retail bill preparation	T1	1	PPT	L3	CO4	PO1-PO4
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
Evaluation method :Quiz							
UNIT V FILES, MODULES, PACKAGES							
49	Files	T1	1	BB	L2	CO5	PO1-PO3
50	Exception	T1	1	BB	L2	CO5	PO1-PO3
51	Text files	R1	1	BB	L2	CO5	PO1-PO3
52	Reading and writing files	R1	1	BB	L2	CO5	PO1-PO3
53	Format operator	T1	1	BB	L2	CO5	PO1-PO3
54	Command line arguments	T1	1	BB	L2	CO5	PO1-PO3
55	Errors and exceptions	R1	1	BB	L2	CO5	PO1-PO3
56	Handling exceptions	R1	1	BB	L2	CO5	PO1-PO3
57	Modules	T1, R1	1	PPT	L4	CO5	PO1-PO4
58	Packages	T1,R1	1	PPT	L4	CO5	PO1-PO4
59	Word count,copy file	R1	1	PPT	L3	CO5	PO1-PO4
60	Voter's age validation, Marks range validation (0-100).	R1	1	BB	L3	CO5	PO1-PO3
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
Evaluation method :Tutorials							
Content Beyond the Syllabus Planned							
1	Plan to give the assignment : 1.Sample Programs for every topic 2.Develop Modules						
Text Books							
1	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. Karl Beecher, “Computational Thinking: A Beginner's Guide to Problem Solving and programming”, 1st Edition,						

Reference Books	
1	Paul Deitel and Harvey Deitel, “Python for Programmers”, Pearson Education, 1st Edition, 2021.
2	G Venkatesh and Madhavan Mukund, “Computational Thinking: A Primer for Programmers and Data Scientists”, 1st Edition, Notion Press, 2021
3	John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data“, Third Edition, MIT Press 2021
4	Eric Matthes, “Python Crash Course, A Hands - on Project Based Introduction to Programming”, 2nd Edition, No Starch Press, 2019.
5	https://www.python.org/
6	Martin C. Brown, “Python: The Complete Reference”, 4th Edition, Mc-Graw Hill, 2018.
7	http://nptel.ac.in/

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

Blooms Level											
Level 1 (L1) : Remembering Level 2 (L2) : Understanding Level 3 (L3) : Applying	Lower Order Thinking	Fixed Hour Exam	Level 4 (L4) : Analysing						Higher Order Thinking	Projects / Mini Projects	
			Level 5 (L5) : Evaluating								
			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	COMPUTATIONAL THINKING AND PROBLEM SOLVING		3	3	6	0	0	0	12	0	12
Unit 2	DATA TYPES, EXPRESSIONS, STATEMENTS		0	10	2	0	0	0	12	0	12
Unit 3	CONTROL FLOW, FUNCTIONS,STRINGS		0	9	3	0	0	0	12	0	12
Unit 4	LISTS, TUPLES, DICTIONARIES		0	7	5	0	0	0	12	0	12
Unit 5	FILES, MODULES, PACKAGES		0	8	2	2	0	0	10	2	12
Total			3	37	18	2	0	0	58	2	60
Total Percentage			5	62	30	3	0	0	97	3	100

CO PO Mapping														
	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO8	PO 9	PO 10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	0	0	0	0	0	0	0	0	3	2
CO2	3	3	3	0	0	0	0	0	0	0	0	0	3	2
CO3	3	3	3	2	0	0	0	0	0	0	0	0	3	2
CO4	3	3	3	3	0	0	0	0	0	0	0	0	3	2
CO5	3	3	3	3	0	0	0	0	0	0	0	0	3	2
Avg	3	3	3	2	0	0	0	0	0	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 : SENTHIL PANDI S
Head of the Department :