

Lesson Plan: Python for Computational Problem Solving [Theory]
of slots: 102
Credits: 5
Course code: UE24CS151A
Theory Anchor:
Prof. Sindhu R Pai

Class #	Unit #	Topics to be covered	% of Portions covered	
			% of syllabus	Cumulative
1 to 6	Boot Strap Activities			
7	Unit - 1	Introduction to the course Title, Syllabus, Lesson Plan and Discussion of Evaluation Policy	25%	25%
8		Problem Solving - Computational and Non-Computational. Discussion on Examples for both		
9		Process of Computational Problem Solving - Analysis, Design, Implementation, Testing		
10		Digital Computer - Computer Hardware		
11		Digital Computer - Computer Software: Operating System		
12		Introduction to Programming Languages		
13		Syntax, semantics and program translation		
14		Python installation, Different modes of Running the python code, First Program in Python and Program Structure		
15		Output function in detail and variables		
16		type and id functions with discussion continuing on variables		
17		Input function in detail		
18		Operators and Expressions		
19		Operators and Expressions		
20		Precedence and Associativity of operators		
21		Control structures - Selection statements		
22		Control structures - Looping statements		
23		Problem solving using Control structures and input function		
24		Practice Session and Revision		
25	Unit - 2	General introduction to Data Structures in python	25%	50%
26		List and it's operations		
27		List continuation, Tuple and it's operations		
28		Problem Solving using Lists and Tuples		
29		Dictionary and it's operations		
30		Problem solving using Dictionary		
31		Set and it's operations		
32		Problem solving using dictionary and sets		
33		String and it's types		
34		String Operations		
35		Problem solving using strings		
36		Introduction to Files		
37		File operations: Working with Text files(read and write)		
38		File operations: Working with CSV files(read and write)		
39		Functions: Definition and Call		
40		Positional and keyword parameters		

41		Variable number of arguments and Key value pair as arguments				
42		Combination of Variable number of args and key value pairs				
43		Problem Solving using combination of Data structures - List, set, Dictionary and strings				
44						
45					Problem Solving using Text file and CSV file data.	
46		Revision				
47		Solving Level - 1 Problem: Banana Problem				
48						
49	Unit - 3	Recursion	25%	75%		
50		Programs on Recursion				
51		callbacks				
52		Programs on callback				
53		Closures				
54		Decorators				
55-60	ISA - 1 Week					
61	Unit - 3	Generators				
62		Problem solving using Closures and Decorators				
63		Problem solving using Generators				
64		Graphical User Interface with Tkinter package- Different geometric methods – Tk, mainloop				
65		Creating simple GUI - buttons, canvas, check button, labels, entry fields				
66		Creating simple GUI - Dialogs Widgets - sizes, fonts, colours layouts,				
67		Problem solving with GUI included				
68		Introduction to modules				
69		Import mechanism				
70		Problem solving using builtin and user defined modules				
71		Testing - pytest, doctest				
72		Debugging - pdb				
73		Solving Level - 2 Problem: Orange Problem				
74						
75	Unit - 4	Introduction to Functional Programming - Map in detail	25%	100%		
76		Filter in detail				
77		Problem solving using map and filter				
78		Lambda				
79		reduce, min and max				
80		zip, List comprehension				
81		Problem solving using all functional programming constructs				
82		Introduction to Object Oriented programming				
83		Classes and objects				
84		Inheritance				
85		Polymorphism				
86		Iterators				
87		Problem Solving using OOP				
88		Exceptions - try, except, else, finally, raise				
89		Exception Propagation				
90		Problem Solving using classes and objects with exception handling				
91		Problem Solving sessions				
92		Revision				
93		Doubt clarification				
94		MCQ Practice Quizes				
95		Revision				
96		Revision				
97-102	ISA - 2 Week					