

Advanced Python Programming

Course Code	20CS6421	Year	II	Semester	II
Course Category	Honors	Branch	CSE	Course Type	Integrated
Credits	4	L-T-P	3-0-2	Prerequisites	Python Programming
Continuous Internal Evaluation :	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to

CO1	Understand python standard template library modules.	L2
CO2	Apply various text processing and mathematical functions to solve complex problems.	L3
CO3	Apply functional styles for implementing algorithms elegantly and concisely.	L3
CO4	Apply suitable data structures for efficient use of memory.	L3
CO5	Analyze programs using STL modules.	L4
CO6	Develop python programs for a given problem.	L3

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	√									√		√		
CO2	√									√		√		
CO3	√									√		√		
CO4	√									√		√		
CO5		√								√		√		

Syllabus

Unit No.	Contents	Mapped CO
I	Mathematics: <i>decimal</i> -Fixed and Floating Point Math, <i>Fractions</i> -Rational Numbers, <i>random</i> -Pseudorandom Number Generators, <i>math</i> -Mathematical Functions, <i>and statistics</i> -Statistical Calculations.	CO1,CO2,CO5
II	Text: <i>string</i> -Text Constants and Templates, <i>textwrap</i> -Formatting Text Paragraphs, <i>re</i> -Regular Expressions, <i>difflib</i> -Compare Sequences.	CO1,CO2,CO5
III	Algorithms: <i>functools</i> -Tools for Manipulating Functions, <i>itertools</i> -Iterator Functions, <i>operator</i> - Functional Interface to Built-in Operators, <i>contextlib</i> -Context Manager Utilities. Threads: <i>threading</i> -Manage concurrent Operations, <i>multiprocessing</i> -Manage Process like Threads.	CO1,CO3,CO4,CO5
IV	Data Structures: <i>enum</i> -Enumration Type, <i>collections</i> -Container Data Types, <i>array</i> -Sequence of Fixed-Type Data, <i>heapq</i> -Heap Sort Algorithm, <i>bisect</i> -Maintain Lists in Sorted Order.	CO1,CO4,CO5
V	Data Structures: <i>Queue</i> -Thread_Safe FIFO Implementation, <i>struct</i> -Binary Data Structures, <i>weakref</i> -Impermanent Reference to Objects, <i>copy</i> -Duplicate Objects, <i>pprint</i> -Pretty Print Data Structures.	CO1,CO4,CO5

Expt. No.	Experiment Details	Mapped CO
1.	Implement programs using various functions in decimal, fractions, random, math and statistics modules.	CO1,CO2,CO3,CO4,CO5
2.	Develop a solution to the given problem by using suitable mathematical functions.	CO1,CO2,CO3,CO4,CO5
3.	Implement various functions in string, textwrap, re, difflib modules.	CO1,CO2,CO3,CO4,CO5
4.	Build solution to the given problem by using advanced text manipulation functions.	CO1,CO2,CO3,CO4,CO5
5.	Implement various functions in functools, itertools, operator, contextlib modules.	CO1,CO2,CO3,CO4,CO5
6.	Develop programs using functions in threading, multiprocessing modules.	CO1,CO2,CO3,CO4,CO5
7.	Develop a solution to the given problem to achieve concurrency.	CO1,CO2,CO3,CO4,CO5
8.	Implement programs using functions in enum, collections, array, heapq, bisect, queue, struct, weakref, copy, pprint modules.	CO1,CO2,CO3,CO4,CO5

Learning Resources

Text Books

1. The Python 3 Standard Library by Example, Doug Hellmann, 2017, Pearson.

References Text Book

1. Modern Python Standard Library Cookbook, Alessandro Molina, 2018, Packt.
2. The Python Library Reference: Release 3.6.4 - Book 1 of 2, Guido Van Rossum, Python Development Team, 2018, 12th Media Services.

e-Resources and other Digital Material

1. <https://media.oaipdf.com/pdf/21fee97b-17fd-4581-8eed-5d3fcdd0c86a.pdf>
2. <https://docs.python.org/3/library/index.html>
3. <https://github.com/lanzhiwang/python3-standard-library-example/tree/master/source>
4. <https://github.com/packtpublishing/modern-python-standard-library-cookbook>