Course code	Computer Programming: Python	L	T	P	C
BCSE101E		1	0	4	3
Pre-requisite	NIL	Syllabus version			
		v. 1.0			

Course Objectives

1. To provide exposure to basic problem-solving techniques using computers.
2. To inculcate the art of logical thinking abilities and propose novel solutions for real world problems through programming language constructs.

Course Outcome

1. Classify various algorithmic approaches, categorize the appropriate data representation, and demonstrate various control constructs.
2. Choose appropriate programming paradigms, interpret and handle data using files to propose solution through reusable modules; idealize the importance of modules and packages.

Module:1	Introduction to Problem Solving	1 hour

Problem Solving: Definition and Steps, Problem Analysis Chart, Developing an Algorithm, Flowchart and Pseudocode.

Module:2	Python Programming Fundamentals	2 hours

Introduction to python – Interactive and Script Mode – Indentation – Comments – Variables – Reserved Words – Data Types – Operators and their precedence – Expressions – Built-in Functions – Importing from Packages.

Module:3	Control Structures	2 hours

Decision Making and Branching: if, if-else, nested if, multi-way if-elif statements – Looping: while loop, for loop – else clauses in loops, nested loops – break, continue and pass statements.

Module:4	Collections	3 hours

Lists: Create, Access, Slicing, Negative indices, List methods, List comprehensions – Tuples: Create, Indexing and slicing, Operations on tuples – Dictionary: Create, add, and replace values, Operations on dictionaries – Sets: Creation and operations.

Module:5	Strings and Regular Expressions	2 hours

Strings: Comparison, Formatting, Slicing, Splitting, Stripping – Regular Expressions: Matching, Search and replace, Patterns.

Module:6	Functions and Files	3 hours

Functions – Parameters and Arguments: Positional arguments, Keyword arguments, Parameters with default values – Local and Global scope of variables – Functions with Arbitrary arguments – Recursive Functions – Lambda Function. Files: Create, Open, Read, Write, Append and Close – tell and seek methods.

Module:7	Modules and Packages	2 hours

Built-in modules – User-Defined modules – Overview of Numpy and Pandas packages.

	Total Lecture hours:	15 hours

Text Book(s)

1. Eric Matthes, Python Crash Course: A Hands-On, Project-Based Introduction to Programming, 2nd Edition, No starch Press, 2019

Reference Books				
1.	Martic C Brown, Python: The Complete Reference, 4th Edition, McGraw Hill Publishers, 2018.			
2.	John V. Guttag, Introduction to computation and programming using python: with applications to understanding data. 2nd Edition, MIT Press, 2016.			
Mode of Evaluation: Written assignments and Quiz.				
Indicative Experiments				
1.	Problem Analysis Chart, Flowchart and Pseudocode Practices.			
2.	Sequential Constructs using Python Operators, Expressions.			
3.	Branching (if, if-else, nested if, multi-way if-elif statements) and Looping (for, while, nested looping, break, continue, else in loops).			
4.	List, Tuples, Dictionaries & Sets.			
5.	Strings, Regular Expressions.			
6.	Functions, Lambda, Recursive Functions and Files.			
7.	Modules and Packages (NumPy and Pandas)			
		Total Laboratory Hours	60 hours	
Text Book(s)				
1.	Mariano Anaya, Clean Code in Python: Develop maintainable and efficient code, 2nd Edition, Packt Publishing Limited, 2021.			
Reference Books				
1.	Harsh Bhasin, Python for beginners, 1st Edition, New Age International (P) Ltd., 2019,			
Mode of assessment: Continuous assessments and FAT				
Recommended by Board of Studies	03-07-2021			
Approved by Academic Council	No. 62	Date	15-07-2021	