



K. S. INSTITUTE OF TECHNOLOGY

An Autonomous Institution under VTU, Approved by AICTE

Department of Computer Science and Engineering

FIRST/SECOND SEMESTER SYLLABUS

Course: Introduction to Python Programming		Semester	I/II
Course Code	25BPLC105A/205A	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40 Hours	Total Marks	100
Credits	03	Exam Hours	03
Examination type (SEE)	Theory		

Course Objectives (Course Skill Set)

1. Learn the syntax and semantics of the Python programming language.
2. Illustrate the process of structuring the data using lists, tuples
3. Appraise the need for working with various documents like Excel, PDF, Word and Others.
4. Demonstrate the use of built-in functions to navigate the file system.
5. Implement the Object Oriented Programming concepts in Python.

Module-1

The way of the program: The Python programming language, what is a program? What is debugging? Syntax errors, Runtime errors, Semantic errors, Experimental debugging.

Variables, Expressions and Statements: Values and data types, Variables, Variable names and keywords, Statements, Evaluating expressions, Operators and operands, Type converter functions, Order of operations, Operations on strings, Input, Composition, The modulus operator.

Iteration: Assignment, Updating variables, the for loop, the while statement, The Collatz $3n + 1$ sequence, tables, two-dimensional tables, break statement, continue statement, paired data, Nested Loops for Nested Data.

Functions: Functions with arguments and return values.

Chapters: 1.1-1.7, 2.1-2.12, 3.3, 4.4, 4.5

Number of Hours:8

Module-2

Strings: Working with strings as single things, working with the parts of a string, Length, Traversal and the for loop, Slices, String comparison, Strings are immutable, the in and not in operators, A find function, Looping and counting, Optional parameters, The built-in find method, The split method, Cleaning up your strings, The string format method.

Tuples: Tuples are used for grouping data, Tuple assignment, Tuples as return values, Composability of Data Structures.

Lists: List values, accessing elements, List length, List membership, List operations, List slices, Lists are mutable, List deletion, Objects and references, Aliasing, cloning lists, Lists and for loops, List parameters, List methods, Pure functions and modifiers, Functions that produce lists, Strings and lists, list and range, Nested lists, Matrices.

Chapter: 5.1, 5.2, 5.3

Number of Hours: 8

Module-3

Dictionaries: Dictionary operations, dictionary methods, aliasing and copying.

Numpy: About, Shape, Slicing, masking, Broadcasting, dtype.

Files: About files, writing our first file, reading a file line-at-a-time, turning a file into a list of lines, Reading the whole file at once, working with binary files, Directories, fetching something from the Web.

Chapter: 5.4, 6.1-6.5, 7.1-7.8

Number of Hours:8

Module-4	
<p>Modules: Random numbers, the time module, the math module, creating your own modules, Namespaces, Scope and lookup rules, Attributes and the dot Operator, Three import statement variants.</p> <p>Mutable versus immutable and aliasing</p> <p>Object oriented programming: Classes and Objects — The Basics, Attributes, Adding methods to our class, Instances as arguments and parameters, Converting an instance to a string, Instances as return values.</p>	
<p>Chapter: 8.1-8.8, 9.1, 11.1 Hours: 8</p>	<p>Number of</p>
Module-5	
<p>Object oriented programming: Objects are mutable, Sameness, Copying.</p> <p>Inheritance: Pure functions ,Modifiers, Generalization, Operator Overloading, Polymorphism.</p> <p>Exceptions: Catching Exceptions, Raising your own exceptions.</p>	
<p>Chapter: 11.2.2-11.2.4, 11.3.2-11.3.9, 12.1, 12.2</p>	<p>Number of Hours:8</p>
<p>Course outcome (Course Skill Set) At the end of the course, the student will be able to:</p> <p>CO1: Demonstrate proficiency in handling loops and creation of functions.</p> <p>CO2: Develop python programs using core data structure.</p> <p>CO3: Make use of file operations and Python standard libraries for programming.</p> <p>CO4: Apply concepts of Python modules and examine the OOP concepts for Application using python.</p> <p>CO5: Illustrate the concepts of Object-Oriented Programming as used in Python.</p>	
<p>Suggested Learning Resources: (Text Book/ Reference Book/ Manuals):</p> <p>Text books:</p> <ol style="list-style-type: none"> 1. Peter Wentworth, Jeffrey Elkner, Allen B. Downey and Chris Meyers- How to think like a computer scientist: learning with python 3. Green Tea Press, Wellesley, Massachusetts,2020 https://media.readthedocs.org/pdf/howtothink/latest/howtothink.pdf <p>Reference books / Manuals:</p> <ol style="list-style-type: none"> 1. Al Sweigart,“ Automate the Boring Stuff with Python, 2nd Edition: Practical Programming for Total Beginners”,2nd Edition, No Starch Press, 2022. (Available under CC-BY-NC-SA license at https://automatetheboringstuff.com/) 2. Kyla McMullen, Elizabeth Matthews and June Jamrich Parsons, Programming with Python, Cengage, 2023 	
<p>Web links and Video Lectures (e-Resources):</p> <p>https://www.learnbyexample.org/python/</p> <p>https://www.learnpython.org/</p> <p>https://pythontutor.com/visualize.html#mode=edit</p>	
<p>Teaching-Learning Process (Innovative Delivery Methods): The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching-learning process and facilitate the achievement of course outcomes.</p> <ol style="list-style-type: none"> 1. Chalk and talk 2. PPT presentation 3. Demonstration 4. Problem-Based Learning (PBL) 5. Case-Based Teaching 	

Assessment Structure:

The assessment in each course is divided equally between Continuous Internal Evaluation (CIE) and the Semester End Examination (SEE), with each carrying 50% weightage.

- To qualify and become eligible to appear for SEE, in the **CIE**, a student must score at least **40% of 50 marks**, i.e., **20 marks**.
- To pass the **SEE**, a student must score at least **35% of 50 marks**, i.e., **18 marks**.
- Notwithstanding the above, a student is considered to have **passed the course**, provided the combined total of **CIE and SEE is at least 40 out of 100 marks**.

Continuous Comprehensive Assessments (CCA):

CCA will be conducted for a total of 25 marks. It is recommended to include a maximum of two learning activities aimed at enhancing the holistic development of students. These activities should align with course outcomes and promote higher-order thinking and application-based learning.

Learning Activity -1: Programming Assignment (Marks- 25)**INSTRUCTIONS:**

1. Course instructor will refer to HackerRank/HackerEarth/LeetCode or any other platform to derive the questions for problem-solving.
 2. Course Instructor must identify programming problems from these sections: Statements (control), Arrays, Strings, Structures & Unions and Functions.
 3. Course instructor will assign **THREE** questions from each section to the students for design of algorithm, program and coding/execution.
 4. Students must demonstrate the solutions to the course instructor and submit the record containing algorithm, program, debugging/execution and results with observations.
- Course instructor must evaluate the student performance as per the rubrics.