Syllabus for Bachelor of Vocation (B.Voc), 4ᵗʰ Semester
Branch: Software Development
Subject Name: Python Programming
Subject Code: 21140204

With effective from academic year 2021-22

Type of course: Core

Prerequisite: Object Oriented Programming

Rationale: Python is a modern language useful for writing compact codes specifically for programming in the area of Server side Web development, Data Analytics, AI and scientific computing as well as production tools and game programming. This course covers the basics and advanced Python programming to harness its potential for modern computing requirements.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	**T**	**P**	**C**	**ESE (E)**	**PA (M)**	**ESE (V)**	**PA (I)**	
3	0	0	3	50	0	0	0	50

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Content:

Sr. No.	Content	Total Hrs.	Module % Weightage
1	**Familiarization with the basics of Python programming**: a simple "hello world" program, process of writing a program, running it, and print statements; simple data-types: integer, float, string Introduce the notion of a variable, and methods to manipulate it (concept of L-value and R-value even if not taught explicitly) Knowledge of data types and operators: accepting input from the console, assignment statement, expressions, operators and their precedence.	10	30
2	**Conditional statements:** if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort numbers, and divisibility. Notion of iterative computation and control flow: for, while, flowcharts, decision trees and pseudo code; write a lot of programs: interest calculation, primarily testing, and factorials.	10	20
3	**Idea of debugging**: errors and exceptions; debugging: pdb, break points. Devices, Troubleshooting Devices & Drivers, and Managing system updates. **Lists, tuples and dictionary**: finding the maximum, minimum, mean;linear search on list/tuple of numbers, and counting the frequency of elements in a list using a dictionary. Introduce the notion of accessingelements in a collection using numbers and names.	12	30
4	**Sorting algorithm**: bubble and insertion sort; count the number of operations while sorting **Strings:** compare, concat, substring; Notion of states and transitionsusing state transition diagrams.	10	20
	Total	**42**	**100**

Reference Books:

1. Python: The Complete Reference, Martin C. Brown, Mc Graw Hill
2. Introduction to Computation and Programming Using Python, John V Guttag, Prentice Hall of India

GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc), 4th Semester
Branch: Software Development
Subject Name: Python Programming
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With effective from academic year 2021-22

3. Introduction to Computing and Problem Solving With Python, Jeeva Jose, Khanna Publishing House
4. Taming Python by Programming, Jeeva Jose, Khanna Publishing House

Suggested Specification table with Marks (Theory): (For BVOC only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	20	0	0	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Course Outcomes:

Sr. No.	CO Statement	Marks % Weightage
CO-1	Understand basics of Python Programming	30
CO-2	To be able to understand the various data structures available in Python programming language	20
CO-3	To be able to do testing and debugging of code written in Python	30
CO-4	To be able to understand sorting algorithms in Python	20

List of Open Source Software/learning website :
Students must refer to following sites to enhance their learning ability.
1. Turtle -https://docs.python.org/2/library/turtle.html
2. PyLab -https://scipy.github.io/old-wiki/pages/PyLab