



GUJARAT TECHNOLOGICAL UNIVERSITY
Syllabus for Bachelor of Vocation (B.Voc.), 4th Semester
Branch: Information Technology
Subject Name: Python Programming
Subject Code: 1140503

Type of subject: Core

Prerequisite: Basics Programming

Rationale: Python is an open-source, high-level, general-purpose programming language used for software development. It is one of the most popular programming languages in the world today and known for its simplicity as well as rich library. It is widely used programming language in various domains, such as Automation, Server-side Web Development, Game Programming, Data Science, Artificial Intelligence, Machine Learning etc. It's relatively easy to learn to use and incredibly versatile. This course aims to teach the basics of Python programming. At the end of the course, students will be able to develop simple applications using Python programming. This knowledge will provide a solid foundation for exploring advanced applications of Python programming in the different domains mentioned above.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical		
				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

Contents:

Sr. No.	Content	Total Hrs.	Module % Weightage
1	Fundamentals of Python: Introduction to Python, History of Python, Python Features, Python Applications, Keywords and Identifiers, Data types and Variables, Type Casting, Input-Output functions: input, print, Operators.	5	12
2	Control Flow Statements: if, if-else statements, if-if-else and Nested if-else statements, for loop, while loop, Nested loops, break, continue and pass statements	6	14
3	Lists, Tuples, Sets and Dictionaries: Lists and operations on Lists, Tuples and operations on Tuples, Sets and operations on Sets, Dictionaries and operations on Dictionaries	9	21
4	Functions and Modules: Introduction to Python User defined Function, passing parameters to a function and returning values from a function, Recursion, Standard Library: Built-in Functions, Modules and Packages:rand module - Random numbers generators, math module – Mathematical functions, datetime module - Date and time functions, matplotlib module – Plotting functions, Create and import custom user defined module	9	21



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5	String Processing: Introduction to String, Access String elements using index operator. String functions: Basic functions: len, max, min, Testing functions: isalnum, isalpha, isdigit, isidentifier, islower, isupper, and isspace, Searching functions: endswith, startswith, find, rfind, count, Manipulation functions: capitalize, lower, upper, title, swapcase, replace, lstrip, rstrip, strip, Formatting functions: format, center, ljust, rjust	8	20
6	File Handling: Introduction to Text files, File Handling functions: Basic functions: open, close, Reading file: read, readline, readlines, Writing file: write, append, writelines	5	12
TOTAL		42	100

Reference Books:

1. Python for data science for dummies.
2. 2nd Edition, John Paul Mueller, Luca Massaron, Wiley.
3. Programming through Python, M. T. Savaliya, R. K. Maurya, G. M. Magar, STAREDU Solutions.
4. Pandas for everyone: Python Data Analysis, Daniel Y. Chen, Pearson.
5. Introducing Data Science: Big Data, Machine Learning, and More, Using Python Tools, Davy Cielen, Arno D.B. Meysman, et al., Mining.
6. Applied Data Science with Python and Jupyter: Use powerful industry-standard tools to unlock new, actionable insights from your data, Packt.
7. Data Analytics, Anil Maheshwari, McGrawHill.
8. Data Science from Scratch: First Principles with Python, Joel Grus, SPD.
9. Star Data Science Specialist, STAR CERTIFICATION.

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	30	30	30	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	Develop programs to solve the given simple computational problems.	12
CO-2	Apply control flow structures to solve the given problems.	14
CO-3	Implement data structures lists, tuples, sets and dictionaries to solve the given problems.	21
CO-4	Apply modular programming approach to solve given problems using user-defined functions.	21
CO-5	Perform string manipulation operations to solve a given problem.	20
CO-6	Perform file operations to solve a given problem.	12



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Laboratory work: NA

List of Open-Source Software/learning website:

Students must refer to the following sites to enhance their learning ability.

Web Resources: -

- 1) www.anaconda.com
- 2) www.python.org
- 3) www.w3schools.com
- 4) <https://www.learnpython.org/>