

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering
Subject Code: 3152413
Semester – V
Subject Name: Python Programming (Power Electronics)

Type of course: Professional Elective Course (Professional Elective – I)

Prerequisite: Programming for Problem Solving

Rationale: Power Electronics is an emerging field/technology and it has found many applications ranging from residential and commercial to industrial sector. This course is aimed to get an insight of the applications of Power Electronics in the consumer products in various sectors and its importance in day to day life.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	Introduction to Python: Programming concepts, algorithm, Program development, The basic elements of python, Branching Programs, Control Structures, Strings and Input, Iteration	6
2	Functions, Scoping and Abstraction: Functions and scoping, Specifications, Recursion, Global variables, Modules, Files, System Functions and Parameters	6
3	Structured Types, Mutability and Higher-Order Functions: Strings, Tuples, Lists and Dictionaries, Lists and Mutability, Functions as Objects	6
4	Testing, Debugging, Exceptions and Assertions: Types of testing – Black-box and Glass-box, Debugging, Handling Exceptions, Assertions	6
5	Classes and Object-Oriented Programming: Abstract data types and classes, Inheritance, Encapsulation and information hiding	6
6	Advanced Topics: Search Algorithms, Sorting Algorithms, Hash Tables, File management, Plotting graphs	6

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

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	25	25	20	10	0

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

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Reference Books:

- 1 Introduction to Computation and Programming Using Python, John V Guttag. Prentice Hall of India
- 2 Core Python Programming, R. Nageswara Rao, , dreamtech 3
- 3 Core Python Programming - Second Edition, Wesley J. Chun, Prentice Hall
- 4 Data Structures and Algorithms in Python, Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, Wiley
- 5 Fundamentals of Python – First Program, Kenneth A. Lambert, Cengage Publication
- 6 Professional Python, Luke Sneeringer, Wrox

Course Outcomes:

At the end of the course, student should be able to:

Sr. No.	CO statement	Topics Mapped	Marks % weightage
CO-1	develop Python program to solve small problems of industry	1, 2,3,4,5,6	30
CO-2	use different data structures of Python to ease the complexity of programs.	3,5	40
CO-3	test and debug Python programs	4	15
CO-4	present data in graphical format	6	15

List of Experiments:

Lab experiments shall contain practical/Lab Sessions related to solving simple industrial problems using Python Programming language.

Major Equipment: PCs with IDE and compiler for Python

List of Open Source Software/learning website:

- Learning website:
 - <http://nptel.iitm.ac.in/courses.php>
 - <http://ocw.mit.edu/>
 - <https://swayam.gov.in/>