II Year II Semester **L T P C**

Code: 20EE4202 **1 0 2 2**

PYTHON PROGRAMMING FOR ELECTRICAL ENGINEERS

Preamble: The aim of this course is to allow the students to understand the basic concepts of Python programming to solve the electrical engineering problems

Course Objectives

1. To study the concepts of python syntax and semantics of control flow statements
2. To study the functions, modules and string in Python to solve a problem
3. To study and create programs with Python data structures
4. To implement the Python programming concepts to electrical engineering problems

Course Outcomes

1. Interpret the python syntax and semantics of control flow statements
2. Apply functions, modules and string handling in Python to solve a problem
3. Determine the methods to create and manipulate programs with Python data structures
4. Implement the Python programming to electrical engineering problems

CO – PO & CO – PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2						2			3	2	1	1-
CO2	2	2	2						2			3	1	2	1
CO3		1	1		1						1			2	-
CO4		3	2		2						2			3	-

1 – Weak, 2 – Moderate and 3 – Strong

Unit – I: Introduction to Python **4L+8P**

Theory:

Python variables, Python basic Operators, Understanding python blocks. Python Data Types, Declaring and using Numeric data types: int, float etc.

Practical:

1. Practise Python Installation
2. Running instructions in Interactive interpreter and a Python Script
3. Write a program to purposefully raise Indentation Error and Correct it

Unit – II: Python Program Flow Control **6L+12P**

if else and else if, Simple for loops in python, For loop using ranges, string, list and dictionaries. Use of while loops in python, Loop manipulation using pass, continue, break and else. Programming using Python conditional and loop blocks.

Practical:
Write programs using selection statements
Implement programs on and conditional branching statements
Design and develop programs using Iterative statements- while, for , nested loops
Use Break, continue, pass statements in programs
Understand the usage of else statement in loops with a case study

Unit – III: Strings **4L + 8P**

Using string data type and string operations, Defining list and list slicing, Use of Tuple data type. String, List and Dictionary, Manipulations Building blocks of python programs, string manipulation methods, List manipulation. Dictionary manipulation, Programming using string, list and dictionary in-built functions. Python Functions, Organizing python codes using functions.

Practical:
Apply string formatting operator
Use built in string methods, functions and regular expressions
Define a list and write programs to access and modify elements of a list
Practice basic list operations, methods
Write programs to use list as a stack and queue

Unit – IV: Functions and Modules **4L+8P**

Functions: Function Calls, Built-in functions, type conversion functions, random numbers, math functions, adding new functions, definition and uses, flow of execution, parameters & arguments, fruitful and void functions, why functions?, recursion, scope of a variable.

Modules: Packages small description about modularity, Third Party Packages, A brief tour of standard library, command line arguments, Error output redirection and program termination, String pattern matching, Mathematics, Internet Access, Dates & times, Data Compressions.

Practical:
Develop Python programs using recursive and non-recursive functions

Unit – V: Application to Electrical Engineering Problems **2L+4P**

Basics of estimating, case study

Practical:
Develop the Python programming to demonstrate the forecasting of electricity prices, global solar radiation

Text Books:

1. Reema Thareja, “Python Programming Using Problem Solving Approach”, Oxford University Press, 2019.
2. Charles Severance, "Python for Informatics- Exploring Information", 1stedition Shroff Publishers, 2017.
3. Vamsi Kurama, "Python Programming: A Modern Approach", Pearson India, 2017.

Reference Books:

1. Mark Lutz,"Learning Python", 5th edition, Orielly, 2013.
2. Allen Downey "Think Python, How to Think Like a Computer Scientist",2nd edition, Green Tea Press, 2015
3. W.Chun , "Core Python Programming", 2nd Edition, Prentice Hall, 2006.
4. Kenneth A. Lambert, "Introduction to Python", 1st edition, Cengage Learning, 2011.