3CP83: PROGRAMMING WITH PYTHON
CREDITS - 4 (LTP: 3,0,1)

Course Objective:
To impart programming skills of python programming language.

Teaching and Assessment Scheme:

Teaching Scheme (Hours per Week)			Credits	Assessment Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	CE	ESE	CE	
3	0	2	4	60	40	20	30	150

Course Contents:

Unit No.	Topics	Teaching Hours
1	**Introduction** Basic elements of python; Control Structures; Strings and Inputs.	04
2	**Functions, Scoping and Abstraction** Functions and scoping; Specifications; Recursion; Global variables; Modules; Files; System Functions and Parameters.	06
3	**Structured Types, Mutability and Higher-Order Functions** Tuples; Lists and Dictionaries; Lists and Mutability; Functions as Objects.	04
4	**Testing, Debugging, Exceptions and Assertions** Types of testing; Black-box and Glass-box; Debugging; Handling Exceptions; Assertions.	04
5	**Classes and Object-Oriented Programming** Abstract Data Types and Classes; Inheritance; Encapsulation and Information Hiding.	05
6	**Advanced Topics** Plotting using PyLab; Network Programming – Sockets; Graphics and GUI Programming; Drawing using Turtle, Tkinter and Python; Other GUIs; Database Access.	15
7	**Hardware Interfacing** Introduction; Arduino IOP, Programming PYNQ-Z1's onboard peripherals - LEDs, switches and buttons; Peripheral Example; Controlling a single LED; Controlling all the LEDs, switches and buttons	07
	Total	45

List of References:

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

Course Outcomes (COs):

At the end of this course student will be able to…

1. Develop proficiency in creating applications using the Python Programming Language.
2. Describe various data structures available in Python programming language and apply them in solving computational problems.
3. Test the code written in Python.
4. Draw various kinds of graphs using PyLab.
5. Perform interfacing with different hardware.
6. Create applications with graphical user interfaces.