AIT 312   **PYTHON PROGRAMMING**   **3(2+1)**

Objective(s)

To build programming logic and thereby developing skills in problem solving using Python programming language; To be able to do testing and debugging of code written in Python, Emphasize the concepts and constructs rather than on language features.

Unit I

Introduction

The basic elements of python, Branching Programs, Control Structures, Strings and Input, Iteration

Unit II

Functions, Scoping and Abstraction

Functions and Scoping Specifications, Recursion, Global variables, Modules, Files, System Functions and Parameters

Unit III

Structured Types, Mutability and Higher-Order Functions

Strings, Lists, Tuples and Dictionaries Lists and Mutability, Functions as Objects

Unit IV

Testing, Debugging, Exceptions and Assertions

Types of testing – Black-box and Glass-box, Debugging, Handling Exceptions, Assertions

Unit V

Classes and Object-Oriented Programming

Abstract Data Types and Classes, Inheritance, Encapsulation and Information Hiding

Unit IV

Advanced Topics

Regular Expressions – REs and Python, Plotting using PyLab, Graphics and GUI Programming – Drawing using Turtle, Tkinter and Python, Other GUIs

Practical(s)

1. **Basic Python Programs :**Print Hello world! ,Add Two Numbers,Find the Square Root,Calculate the Area of a Triangle,Solve Quadratic EquConvert Celsius To Fahrenheit ationSwap Two Variables,Generate a Random Number,Convert Kilometers to Miles etc

2. **Decision Making and Loop:**Check if a Number is Positive, Negative or 0 ,Check if a Number is Odd or Even,Check Leap Yea ,Find the Largest Among Three Numbers, Check Prime Number,Print all Prime Numbers in an Interval,Find the Factorial of a Number,Display the multiplication Table,Print the Fibonacci sequence,Check Armstrong Number,Find Armstrong Number in an Interval

3. **Function :**Display Powers of 2 Using Anonymous Function ,Find Numbers Divisible by Another Number,Convert Decimal to Binary, Octal and Hexadecimal,Find ASCII Value of Character,Find HCF or GCD,Find LCM ,Find Factors of Number,Make a Simple Calculator,Shuffle Deck of Cards,Display Calendar,Display Fibonacci Sequence Using Recursion,Find Sum of Natural Numbers Using Recursion,Find Factorial of Number Using Recursion,Convert Decimal to Binary Using Recursion

4. **Native Data type :** To Add Two Matrices, To Transpose a Matrix, To Multiply Two Matrices , To Check Whether a String is Palindrome or No, To Remove Punctuations From a String, To Sort Words in Alphabetic Order, To Illustrate Different Set Operations

5. **File :**To Merge Mails ,to Find the Size (Resolution) of a Image ,to Find Hash of File

Reference Book(s)

1. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India
2. Allen Downey, Jeffrey Elkner, Chris Meyers ,How to think like a computer scientist : Learning with Python,Freelyavailableonline.2012
3. T. Budd, Exploring Python, TMH, 1st Ed, 2011
4. Python Tutorial/Documentation www.python.or 2010
5. Swaroop C H, "**A Byte of Python**", 2003-2005 , Book released under Creative Common License.
6. Allen Downey, Jeffrey Elkner, Chris Meyers, "*How to Think Like a Scientist – Learning with Python ",* Green Tea Press, 2002, First Edition.
7. Guido van Rossum, *"Python Tutorial – Release 2.3.3"* 2003, Python Software Foundation Ltd.
8. https://www.programiz.com/python-programming