SYLLABUS

CERTIFICATE COURSE

APH3CC01PYTHON- A STEPPING STONE TO ARTIFICIAL INTELLIGENCE

1. Basics of Python **(3 hours)**

Introduction, High Level language, Compiler and Interpreter, Development of Computer Programme, Advantages of Python over other languages, Interactive mode and File mode, Python Programme Layout, Input and Output statements, Variables and rules for naming variables.

2. Data types in Python and Functions **(10 hours)**

Basic data types in Python - Numeric, String, List, Tuples, Dictionaries, Boolean, Sets, Operations and Built in functions for each datatype.

Type conversion, Python Operators, Statements and Expressions.

Functions, User defined and Built in Functions, Formatted output

3. Conditional, Control Statements and File Operations **(7 hours)**

If- elif- else statement, nested if, while statement, for loop, break and continue statements

File Operations- Read, write and Open

4. Numerical Methods **(10 hours)**

Advantages of Numerical Methods, Curve Fitting- Least square approximation-fitting of a straight line, Finite difference operator, Interpolation, Numerical Differentiation, Numerical Integration, Root finding- Newton Raphson method, Numerical solution of differential equation- Euler's method

5. Programming using Python (10 hours)

Programs to do basic arithmetic operations- finding square root, area of a rectangle, swap the values of two variables, to check if a number is even and odd, to check if a year is leap year or not, to display the Fibonacci sequence or n terms with and without using recursion, to print the factors of a number, to find the factorial of a number, operations using matrices, generation of dictionary, position and velocity of a freely falling body in air and in viscous medium

Reference:

1. Introduction to Computing and Problem Solving Using Python by E Balagurusamy

2. Python for Education by Ajith Kumar

3. Computational Physics by VK Mittal, RC Verma and SC Gupta