

Department of Mathematics , PSMO College

A certificate course : Python for numerical computations.

Syllabus

Module 1

Literal Constants, Numbers, Strings, Variables, Identifier, Data types, Operators, Operator Precedence, Expressions, Control flow: If, while, for, break, continue statements. Functions: Defining a function, function parameters, local variables, default arguments, keywords, return statement, Doc-strings

Module 2

. Modules: using system modules, import statements, creating modules, Data Structures: Lists, tuples, sequences. Writing a python script, Files: Input and output using file and pickle module, Exceptions: Errors, Try-except statement, raising exceptions, try-finally statement

Module 3

GCD of two numbers, To Check an integer prime, Evaluation of Totient Function, Writing of Fibonacci sequence. Listing of prime numbers Average and maximum of a set of numbers. Lagrange Interpolation. Newton's Interpolation. Bisection Method. Newton-Raphson Method. Numerical Differentiation of continuous function. Numerical Differentiation of tabulated function. Trapezoidal rule of Integration. Simpson's rule of Integration

References:

- [1] Swaroop C H: , A Byte of Python.
- [2] Amit Saha: ,Doing Math with Python, No Starch Press, 2015.
- [3] SD Conte and Carl De Boor : Elementary Numerical Analysis (An algorithmic approach) 3rd edition, McGraw-Hill, New Delhi
- [4] K. Sankara Rao : Numerical Methods for Scientists and Engineers Prentice Hall of India, New Delhi.
- [5] Carl E Froberg : Introduction to Numerical Analysis, Addison Wesley Pub Co, 2nd

Edition

[6] Online reading <http://pythonbooks.revolunet.com/>

Course outcome s:

1. Have a fundamental understanding of the Python programming language.
2. Acquire the pre-requisite Python skills to move into specific branches - Machine Learning, Data Science, etc..
3. Understand how to create your own Python programs.
4. Have the fundamental skills and understanding of Python to confidently apply for Python programming jobs.