Certificate Course on Python Programming

Department of Physics

30 Hours Add-on Course

Course Objectives

- To introduce the fundamentals of Python programming.
- To develop problem-solving skills using Python.
- To perform scientific and numerical computations.
- To visualize and analyze data using Python libraries.

Course Outcomes

- Understand basic Python programming concepts.
- Write simple programs using loops, functions, and data structures.
- Use Python for scientific computation and graph plotting.
- Apply Python programming in physics-related problems.

Detailed Syllabus

Module I: Introduction to Python (6 Hours)

Introduction to Python, installation, variables, data types, operators, and input-output statements.

Module II: Control Statements and Functions (8 Hours)

Conditional statements, loops, break and continue, functions, and user-defined functions.

Module III: Data Structures and File Handling (6 Hours)

Lists, tuples, dictionaries, strings, file handling, reading and writing files.

Module IV: Scientific Python and Visualization (10 Hours)

Introduction to NumPy, array operations, Matplotlib, plotting graphs, and an introduction to Pandas.

Practical

- Writing and executing simple Python programs.
- Programs on factorial, Fibonacci series, and prime numbers.
- Programs using loops and functions.
- Plotting graphs using Matplotlib.
- Reading experimental data from files.
- Simple numerical, mathematical, and physics-based computations.

Assessment Method

Component	Marks
Attendance	5
Assignment / Practical	20
Final Test	20
Viva-Voce	5
Total	50

Course Certificate

Certificates will be awarded to participants who successfully complete the course with the required attendance and assessment criteria.

22/04/2026

20/04/2026

HOD
Department of Physics
Basugaon College
Basugaon