

ADD ON Course

Organised by

**Department of Mathematics , Department of Computer Science and
Department of Physics**

Session 2024-2025

Course Title : INTRODUCTION OF PYTHON PROGRAMMING

Objectives of the course :

- Everyone should understand about the fundamental logic of programming.
- Everyone should understand how to use the various features of Python
- Everyone should understand how to apply the different features in various problems.
- Everyone should understand about the use of different functions and libraries.
- Everyone should understand about the advance use of python in different applications.

Course Coordinator

- **Dr. Sujit Kumar Kar**

Associate Professor, Department of Mathematics, Dinabandhu Mahavidyalaya,
Bongaon

General Information

Duration : 40 hours

Entry Qualification : Honours and General Students

Language : English

Venue :DinabandhuMahavidyalaya, Bongaon

SYLLABUS OF

INTRODUCTION OF PYTHON PROGRAMMING

➤ Introduction

What is Python? , History of Python, Features of Python, What can be done using Python?, What can be done using Python?, Resources

➤ Basics :

Identifiers and keywords, Python types, Numbers, Strings, Integer and Float ranges, Variable types, Arithmetic operators, Data types, Operators and Expressions, Operator precedence, Type conversions, Operations on Strings, Built-in functions, Library functions

➤ Decision Control

Introduction to decision control, Branching statements, if statement, if-else statement, Nested if statement, Logical operators, Conditional expressions

➤ Repetition Control

Basic loop structure, While loop, for loop, selection of appropriate loop, nested loops, break statement, continue statement, pass statement,

➤ Functions and Modules

What are functions, Communication with functions, Types of arguments, Need of function, function definition, function call, function parameters, variable scope, return statement, Modules, Packages in Python, Standard Library modules,

➤ Console Input and Output

Console input, console output, formatted printing

➤ Lists

What is list, list elements access, list operations, list methods,

➤ Tuples

What is tuples, creating tuples, accessing tuple elements, operations on tuple, nested tuples, Advantages of tuple over list

➤ Sets

What is set?, creating set, accessing set elements, set operations, set methods

➤ Dictionaries

What are dictionaries? Creating dictionary, accessing dictionary elements, Dictionary operations, Dictionary methods, nested dictionary, Built-in dictionary functions, Difference between list and dictionary

➤ Strings

What are strings? Accessing string elements, String properties , String operations, String module, Regular expressions

➤ Functional Programming

Lambda function, Higher order functions, Map, Filter, Reduce, Using Lambda with map(), filter(), reduce()

➤ Packages

Packages, Third party packages

- File Handling
File Path, Types of files, Opening and closing files, Input/Output System, File I/O, Read/Write operations File operation modes, Moving within a file, File and directory operations
- Exception Handling
Errors, Exceptions, How to deal with exceptions? Try-except, Built-in and user defined exceptions, else and finally block
- Object oriented programming concepts
Object, Class, Inheritance, Operator overloading
- Python for Data Analysis
Numpy, Pandas, Matplotlib

Course Schedule

Name of the Faculty	Topic	Time
	<p>Introduction</p> <p>What is Python? , History of Python, Features of Python, What can be done using Python?, What can be done using Python?, Resources</p>	2 hour
	<p>Basics :</p> <p>Identifiers and keywords, Python types, Numbers, Strings, Integer and Float ranges, Variable types, Arithmetic operators, Data types, Operators and Expressions, Operator precedence, Type conversions, Operations on Strings, Built-in functions, Library functions</p>	2 hour
	<p>Decision Control</p> <p>Introduction to decision control, Branching statements, if statement, if-else statement, Nested if statement, Logical operators, Conditional expressions</p> <p>Repetition Control</p> <p>Basic loop structure, While loop, for loop, selection of appropriate loop, nested loops, break statement, continue statement, pass statement,</p>	6 hour
	<p>Functions and Modules</p> <p>What are functions, Communication with functions, Types of arguments,</p>	6 hour

	<p>Need of function, function definition, function call, function parameters, variable scope, return statement, Modules, Packages in Python, Standard Library modules,</p> <p>Console Input and Output</p> <p>Console input, console output, formatted printing</p>	
	<p>Lists</p> <p>What is list, list elements access, list operations, list methods,</p> <p>Tuples</p> <p>What is tuples, creating tuples, accessing tuple elements, operations on tuple, nested tuples, Advantages of tuple over list</p> <p>Sets</p> <p>What is set?, creating set, accessing set elements, set operations, set methods</p>	4 hour
	<p>Dictionaries</p> <p>What are dictionaries? Creating dictionary, accessing dictionary elements, Dictionary operations, Dictionary methods, nested dictionary, Built-in dictionary functions, Difference between list and dictionary</p>	2 hour
	<p>Strings</p> <p>What are strings? Accessing string elements, String properties , String operations, String module, Regular expressions</p> <p>Functional Programming</p> <p>Lambda function, Higher order functions, Map, Filter, Reduce, Using Lambda with map(), filter(), reduce()</p>	4 hour
	<p>Packages</p> <p>Packages, Third party packages</p>	2 hour
	<p>File Handling</p> <p>File Path, Types of files, Opening and closing files, Input/Output System, File I/O, Read/Write operations File operation modes, Moving within a file, File and</p>	6 hour

	directory operations Exception Handling Errors, Exceptions, How to deal with exceptions? Try-except, Built-in and user defined exceptions, else and finally block	
	Object oriented programming concepts Object, Class, Inheritance, Operator overloading Python for Data Analysis Numpy, Pandas, Matplotlib	6 hour