**Python Programming (Basics)**

**Course Overview**

The **Python Programming (Basics)** course is designed to introduce students to one of the most beginner-friendly and versatile programming languages — **Python**. Widely used in web development, data science, automation, AI, and app development, Python is known for its clean syntax and robust libraries. This foundational course covers all the core concepts required for writing efficient and error-free Python code and sets the stage for more advanced domains such as machine learning, Django, and data analysis.

Perfect for beginners, this course emphasizes hands-on learning through real-life problems, practice exercises, and mini-projects.

**Course Objectives**

By the end of this course, learners will be able to:

* Understand Python’s syntax, structure, and use cases.
* Write programs using variables, control structures, and functions.
* Work with Python’s built-in data types like strings, lists, dictionaries, and tuples.
* Implement error handling, loops, and basic logic for practical problem-solving.
* Structure Python code using functions and simple modular techniques.
* Read and write files, and perform basic text operations.
* Build mini-console-based applications as a stepping stone to advanced Python topics.

**Syllabus Breakdown**

**Module 1: Introduction to Python**

* History and features of Python
* Installing Python and setting up an IDE (IDLE, PyCharm, VS Code)
* Writing your first Python program
* Understanding syntax, indentation, and comments
* Input and output operations (input(), print())

**Module 2: Variables, Data Types & Operators**

* Variable declaration and dynamic typing
* Data types: numbers, strings, booleans
* Type casting and checking data types
* Arithmetic, logical, relational, and assignment operators
* Operator precedence

**Module 3: Control Flow Statements**

* Conditional statements: if, if-else, if-elif-else
* Loops: for, while
* Loop control: break, continue, pass
* Nested loops and conditions

**Module 4: Strings and String Functions**

* Creating and manipulating strings
* Indexing and slicing
* Common string methods: .upper(), .lower(), .find(), .replace(), .split()
* String formatting with f-strings and .format()

**Module 5: Lists, Tuples, Sets, and Dictionaries**

* List creation, indexing, slicing, and common methods
* Tuple basics and immutability
* Set operations and uniqueness
* Dictionary creation, key-value operations, and methods
* Iterating through data structures

**Module 6: Functions and Modular Programming**

* Defining and calling functions
* Function parameters and return values
* Variable scope: local vs global
* Lambda (anonymous) functions
* import statements and using Python modules

**Module 7: File Handling**

* Reading from and writing to files
* Working with text files (open(), read(), write(), with)
* File modes: read, write, append
* Reading line by line
* Exception handling basics (try, except)

**Module 8: Basic Projects and Practice**

* Project 1: Calculator App
* Project 2: Password Generator
* Project 3: Student Marks Record Manager (using files)
* Bonus exercises: pattern printing, number guessing game, etc.

**Career Opportunities**

Python is the fastest-growing programming language due to its flexibility and real-world applicability. After completing the basics, learners will be equipped to advance into areas such as:

* **Web Development** (with Django or Flask)
* **Data Science and Analytics** (with Pandas, NumPy)
* **Automation and Scripting**
* **Machine Learning / AI**
* **Cybersecurity Scripting**
* **Software and App Development**

Entry-level roles learners may pursue:

* **Python Developer (Junior)**
* **Scripting and Automation Specialist**
* **Trainee Programmer**
* **Data Entry and Data Cleaning Roles with Python**
* **Internships in IT/Data teams**

Python is highly in demand in IT services, startups, financial firms, and educational technology companies.