



## Python Programming

Python is a simple, easy-to-learn programming language used for a wide range of applications like web development, data analysis, and automation. It's known for its readability and has a large library of tools to help developers work efficiently.

Module	Objective	Lesson 1	Lesson 2	Lesson 3	Lesson 4
<b>Module 1: Introduction to Python Programming</b>	Introduce the basic concepts of Python programming and its environment.	<b>What is Python?</b> <ul style="list-style-type: none"> <li>• Overview of Python and its uses</li> <li>• Installing Python and setting up the development environment (IDEs like VSCode, PyCharm)</li> <li>• Introduction to the Python interpreter and the command line</li> </ul>	<b>Python Syntax and Structure</b> <ul style="list-style-type: none"> <li>• Writing your first Python program ("Hello, World!")</li> <li>• Basic syntax: indentation, variables, and comments</li> <li>• Understanding the role of scripts and modules</li> </ul>	<b>Data Types and Variables:</b> <ul style="list-style-type: none"> <li>• Understanding primitive data types: integers, floats, strings, and booleans</li> <li>• Variable assignment and naming conventions</li> <li>• Type casting and type conversion</li> </ul>	
<b>Module 2: Control Flow and Loops</b>	Learn how to control the flow of a program using conditional statements and loops.	<b>Conditional Statements:</b> <ul style="list-style-type: none"> <li>• if, elif, and else statements</li> <li>• Comparison operators (==, !=, &gt;, &lt;, &gt;=, &lt;=)</li> <li>• Logical operators (and, or, not)</li> </ul>	<b>Loops:</b> <ul style="list-style-type: none"> <li>• Understanding while and for loops</li> <li>• Loop control statements: break, continue, pass</li> <li>• Using loops for iteration (e.g., looping through lists, dictionaries)</li> </ul>	<b>Functions and Modular Programming:</b> <ul style="list-style-type: none"> <li>• Defining functions using def</li> <li>• Parameters and return values</li> <li>• Function scope (local vs. global variables)</li> </ul>	
<b>Module 3: Data Structures</b>	Master the built-in data structures in Python for storing and managing data.	<b>Lists and Tuples:</b> <ul style="list-style-type: none"> <li>• List operations: append, insert, remove, slicing, and iterating</li> <li>• Understanding tuples and their immutability</li> </ul>	<b>Dictionaries:</b> <ul style="list-style-type: none"> <li>• Creating and using dictionaries</li> <li>• Accessing, adding, and removing key-value pairs</li> <li>• Iterating through dictionaries</li> </ul>	<b>Sets and Frozensets:</b> <ul style="list-style-type: none"> <li>• Customer service automation, content generation, and educational tools</li> <li>• Limitations of ChatGPT and ethical concerns</li> </ul>	<b>Strings in Python:</b> <ul style="list-style-type: none"> <li>• String methods and operations</li> <li>• String formatting and f-strings</li> <li>• Regular expressions (basic)</li> </ul>
<b>Module 4: Object-Oriented Programming (OOP)</b>	Learn the principles of object-oriented programming using Python.	<b>Introduction to OOP:</b> <ul style="list-style-type: none"> <li>• The four pillars of OOP: Encapsulation, Inheritance, Polymorphism, and Abstraction</li> <li>• Defining classes and creating objects</li> </ul>	<b>Class Methods and Instance Variables:</b> <ul style="list-style-type: none"> <li>• Understanding <code>__init__</code> constructor</li> <li>• Instance variables and methods</li> <li>• Class variables and class methods</li> </ul>	<b>Inheritance and Polymorphism:</b> <ul style="list-style-type: none"> <li>• Creating subclasses and extending functionality</li> <li>• Method overriding</li> <li>• Understanding polymorphism</li> </ul>	<b>Encapsulation and Abstraction:</b> <ul style="list-style-type: none"> <li>• Private and protected members</li> <li>• Using getters and setters</li> <li>• Abstract base classes (ABC) and interfaces</li> </ul>

<b>Module 5: File Handling and Exception Handling</b>	<p>Learn how to read, write, and manipulate files, and handle errors in Python programs.</p>	<p><b>File Handling:</b></p> <ul style="list-style-type: none"> <li>• Reading and writing text files</li> <li>• Working with CSV files and JSON files</li> <li>• Context managers (using with keyword)</li> </ul>	<p><b>Exception Handling</b></p> <ul style="list-style-type: none"> <li>• Using try, except, and finally blocks</li> <li>• Raising exceptions and custom exceptions</li> <li>• Handling multiple exceptions</li> </ul>		
<b>Module 6: Working with Libraries and External Modules</b>	<p>Explore popular Python libraries and modules to enhance functionality</p>	<p><b>Python Standard Library</b></p> <ul style="list-style-type: none"> <li>• Using os, sys, datetime, and math libraries</li> <li>• Working with collections, itertools, and functools</li> </ul>	<p><b>Installing and Managing Packages:</b></p> <ul style="list-style-type: none"> <li>• Using pip to install third-party packages</li> <li>• Introduction to virtualenv and creating virtual environments</li> <li>• Understanding requirements.txt for package dependencies</li> </ul>	<p><b>Web Scraping with BeautifulSoup:</b></p> <ul style="list-style-type: none"> <li>• Introduction to web scraping and HTML parsing</li> <li>• Extracting data from websites using BeautifulSoup</li> </ul>	
<b>Module 7: Data Analysis and Visualization</b>	<p>Learn how to work with data and visualize insights using Python.</p>	<p><b>Introduction to NumPy:</b></p> <ul style="list-style-type: none"> <li>• Understanding arrays and array operations</li> <li>• Array indexing, slicing, and reshaping</li> <li>• Performing mathematical operations with NumPy</li> </ul>	<p><b>Introduction to Pandas:</b></p> <ul style="list-style-type: none"> <li>• Creating and manipulating DataFrames</li> <li>• Reading and writing data (CSV, Excel, SQL)</li> <li>• Data cleaning: handling missing values, filtering data</li> </ul>	<p><b>Data Visualization with Matplotlib and Seaborn:</b></p> <ul style="list-style-type: none"> <li>• Plotting line, bar, and scatter charts</li> <li>• Customizing plots (labels, titles, legends)</li> <li>• Advanced visualizations: histograms, heatmaps, pair plots</li> </ul>	
<b>Module 8: Introduction to Web Development with Python</b>	<p>Learn how to create web applications using Python frameworks.</p>	<p><b>Introduction to Web Development:</b></p> <ul style="list-style-type: none"> <li>• What is web development and how Python fits into it</li> <li>• Overview of web frameworks (Flask, Django)</li> </ul>	<p><b>Building Web Apps with Flask:</b></p> <ul style="list-style-type: none"> <li>• Setting up a Flask application</li> <li>• Creating routes and handling HTTP requests</li> <li>• Template rendering with Jinja2</li> </ul>	<p><b>Building Web Apps with Django:</b></p> <ul style="list-style-type: none"> <li>• Setting up a Django project</li> <li>• Understanding Django models, views, and templates</li> <li>• Creating forms and handling user input</li> </ul>	
<b>Module 9: Introduction to Data Science and Machine Learning</b>	<p>Learn the basics of data science and machine learning with Python.</p>	<p><b>Introduction to Data Science:</b></p> <ul style="list-style-type: none"> <li>• Overview of the data science workflow</li> <li>• Introduction to machine learning concepts</li> <li>• Tools for data science: NumPy, Pandas, Matplotlib, Seaborn</li> </ul>	<p><b>Introduction to Scikit-learn:</b></p> <ul style="list-style-type: none"> <li>• Understanding the Scikit-learn library</li> <li>• Supervised learning algorithms: Linear regression, decision trees</li> <li>• Unsupervised learning algorithms: Clustering</li> </ul>	<p><b>Model Evaluation and Hyperparameter Tuning:</b></p> <ul style="list-style-type: none"> <li>• Understanding model evaluation metrics (accuracy, precision, recall, F1-score)</li> <li>• Cross-validation and hyperparameter tuning</li> </ul>	

<b>Module 10: Advanced Topics</b>	Explore advanced Python concepts and applications.	<b>Multithreading and Multiprocessing:</b> <ul style="list-style-type: none"> <li>• Introduction to multithreading and multiprocessing in Python</li> <li>• Creating threads and processes</li> <li>• Synchronization and concurrency in Python</li> </ul>	<b>Working with APIs:</b> <ul style="list-style-type: none"> <li>• Understanding RESTful APIs</li> <li>• Sending requests using requests library</li> <li>• Parsing JSON responses and interacting with APIs</li> </ul>	<b>Introduction to TensorFlow and PyTorch:</b> <ul style="list-style-type: none"> <li>• Basic concepts of deep learning</li> <li>• Using TensorFlow or PyTorch for building neural networks</li> <li>• Training a simple deep learning model</li> </ul>	
<b>Module 11: Final Project</b>	Apply all Python programming concepts by building a real-world project.	<b>Project Planning and Scope:</b> <ul style="list-style-type: none"> <li>• Identifying the project objectives and planning the solution</li> <li>• Gathering requirements and data sources</li> </ul>	<b>Project Development:</b> <ul style="list-style-type: none"> <li>• Designing and implementing the solution using Python</li> <li>• Testing and debugging the application</li> </ul>	<b>Project Presentation and Documentation</b> <ul style="list-style-type: none"> <li>• Presenting the project to peers or instructors</li> <li>• Writing documentation and reports</li> </ul>	



B-612, Business Zone, Nirvana Country, South City II, Sector - 50, Gurugram - 122018 Haryana, India  
 Phone : 9899181665 | 8743975773  
 Website : [www.edudevfoundatins.org](http://www.edudevfoundatins.org)  
 Email : [info@edudev.com](mailto:info@edudev.com)



[WWW.EDUDEVSFFOUNDATIONS.ORG](http://WWW.EDUDEVSFFOUNDATIONS.ORG)