Basic Python & Introduction to AI

Course Duration: 2 Months • Class Time: 1.5 Hrs

Module 1: Introduction to Python (Week 1-2)

1. Python Basics
- What is Python? Why Python for AI?
- Installing Python and Setting Up the Environment
- Writing and Running Python Code
- Variables, Data Types, and Operators

2. Control Structures
- Conditional Statements (if, elif, else)
- Loops (for, while) and Iteration
- Logical and Comparison Operators

3. Functions & Modules
- Defining and Calling Functions
- Function Parameters and Return Values
- Importing and Using Modules

4. Data Structures
- Lists and Tuples
- Dictionaries and Sets

5. File Handling & Error Handling
- Reading and Writing Files
- Handling Exceptions (try-except statements)

Project: Simple Calculator / To-Do List Application

Module 2: Hands-on Python Projects (Week 3)

6. Libraries for Data Handling
- Introduction to NumPy and Pandas
- Working with Arrays and DataFrames

7. Data Visualization
- Basics of Matplotlib for Graphs and Charts
- Creating Line, Bar, and Pie Charts

8. Mini Project: Analyzing Simple Datasets
- Example: Visualizing Student Exam Scores

Project: Data Analysis on SEE Exam Scores

Module 3: Introduction to AI (Week 4)

9. What is AI?
- Definition and Real-World Applications of AI
- Difference Between AI, ML, and Deep Learning

10. Basics of Machine Learning
- Supervised vs. Unsupervised Learning
- Data Collection and Cleaning Basics

11. Linear Regression (Basic Prediction Model)
- Understanding Regression in AI
- Building a Simple Prediction Model (e.g., Predicting Student Scores)

12. Classification (Basic AI Model)
- What is Classification?
- Hands-on: Classifying Text Data (Sentiment Analysis)

Project: Predicting Student Performance

Module 4: Practical AI Applications (Week 5)

13. Introduction to Chatbots
- What is NLP (Natural Language Processing)?
- Rule-Based Chatbots vs. AI-Powered Chatbots

14. Building a Simple Chatbot in Python
- Using If-Else Logic for Basic Chat Responses
- Improving Responses with Predefined Patterns

15. Introduction to Image Recognition
- Basics of Computer Vision
- Understanding Pre-Trained AI Models for Images

16. Hands-on AI Projects
- Sentiment Analysis on Social Media Data
- Image Classification with Pre-Trained Models

Project: AI Chatbot for Health or Education Support

Module 5: Final Projects & Course Wrap-up (Week 6)

17. Capstone Project Development
- Students choose and develop a project integrating Python and AI concepts
- Example Projects:
  - Student Performance Prediction
  - Simple Chatbot for FAQs
  - Basic Image Classification