

AI & Machine Learning using Python

Course Overview

This course is designed to introduce young learners to Python programming and Artificial Intelligence through interactive, activity-based learning. Students will develop logical thinking, creativity, and problem-solving skills while building real-world projects. After completing this course, students will be able to **design games, apps, and AI projects, strengthen their coding and problem-solving skills**, and gain confidence to pursue future careers in technology and innovation.

Module 1: Introduction to Python Basics

- Introduction to coding and AI, variables, data types, input/output, basic operators
- **Project:** Basic Calculator based on Inputs

Module 2: Logic Building & Control Statements in Python

- If-else conditions, Nested if-else
 - loops, Nesting of Loops, Control statements, problem-solving exercises
- Projects:** Student Marksheets, Voter ID check, Electricity Bill, Income Tax Calculation, Choice based inputs etc

Module 3: Collections & Functions

- Lists, Tuples, Strings, dictionaries
 - Functions and recursion, Python Libraries, Creating your own Library in Python
 - File Handling (Reading, Writing, Append), Export/Import data to/from Excel
- Project:** Student Marks Manager, Storing student records in Excel

Module 4: Turtle Graphics

- Drawing shapes & patterns
 - logic building, decision-making, data representation
- Projects:** Traffic Light Simulation, Digital Clock (Analog Style), Bouncing Ball

Module 5: Game Development (Pygame and Turtle)

- Game logic, Animations, Keyboard control using Pygame and Turtle
- Projects:** Catch the Ball Game, Car Racing Game, Snake Game, Space Shooter Game, Tic Tac Toe Game

Module 6: Data Handling & Visualization

- Libraries: NumPy, Pandas, Matplotlib and Seaborn
- Transforms raw data into interactive visuals, making coding engaging, insightful, and real-world relevant.
- Working with data & charts
Projects: Student Performance Dashboard, Weather Data Tracker, Daily Routine Tracker, Fitness Tracker (Steps Counter) etc.

Module 7: GUI - Interactive Libraries (Tkinter)

- Build interactive graphical user interfaces using :widgets, layouts, and event handling (button click, keyboard input).
- Frames & basic UI design, Dialog boxes (messagebox, input dialogs)

Project: Student Marks Analyzer App, Arithmetic Calculator

Module 8: AI based Projects

- **Image AI :**
Projects: Image Recognition, Face Detection System
- **Voice AI/Text AI**
Projects: Speech Recognition and Text-to-Speech, AI Chatbot

➔ Tools & Technologies

Python, Jupyter Notebook, VS Code, Turtle, Pygame, Pandas, Matplotlib, OpenCV/Tensor Flow, Speech Recognition, Streamlit etc.

➔ Teaching Methodology

20% Theory and 80% Practical approach with gamified learning

➔ Assessment & Certification

Students will be evaluated through assignments, module-based projects, and a final project presentation. Certificate will be awarded upon successful completion.

Part Time: 6-7 Months X 3 Days/week X 1.5- 2 Hrs or **(Sat-Sun) || Full Time:** 4 Months X 5-6 Days/week X 1.5-2 Hrs

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