

Foundations of Artificial Intelligence

Duration: 2 Months (Mon–Fri, ~80–90 Hours)

Mode: Live Online / Classroom

Tools & Technologies: Python (Anaconda/Jupyter), Google Colab, MS Excel, GitHub, Basic ML libraries (Scikit-learn, NLTK overview)

Syllabus

Week 1

- Introduction to AI & Python Environment Setup
- History and evolution of AI, Why Python for AI
- Installing Python (Anaconda, Jupyter, Colab)
- Python basics: syntax, indentation, input/output
- Variables, operators, data types
- Hands-on: First Python program
- Assignment at end of week

Week 2

- Conditional statements (if, elif, else)
- Loops (for, while) with AI examples
- Functions – built-in vs user-defined
- Importing libraries & modular programming
- Hands-on coding exercises
- Assignment at end of week

Week 3

- Python Data Structures – lists, tuples, sets, dictionaries
- Indexing, slicing, nested structures
- Iterating over collections
- Hands-on project: basic data management
- Assignment at end of week

Week 4

- File Handling (txt, csv, json)
- Error Handling (try, except, finally)
- Context managers and debugging basics
- Hands-on: CSV dataset read/write
- Assignment at end of week
- Mock Interview 1

Week 5

- Introduction to AI concepts – AI vs ML vs DL
- Types of AI – Narrow, General, Super
- Components of AI systems
- AI applications in industries
- Case study discussions
- Assignment at end of week

Week 6

- AI Project Lifecycle – CRISP-DM
- Data collection, cleaning, preprocessing
- Feature engineering overview
- Model training & evaluation basics
- Mini-project setup
- Assignment at end of week

Week 7

- AI Ecosystem Tools – TensorFlow, PyTorch, Scikit-learn
- Intro to Cloud AI platforms – AWS, Azure, GCP
- GitHub basics for AI projects
- Hands-on: Kaggle dataset import
- Assignment at end of week

Week 8

- Mini Project – End-to-end AI problem solving
- Documentation & result presentation
- Responsible AI & ethics
- Mock Interview 2
- Final assignment submission

Learning Outcomes

- Understand AI fundamentals and lifecycle
- Set up Python environment for AI projects
- Develop basic Python scripts for AI tasks
- Work with Python data structures and file handling
- Understand AI applications across industries
- Apply CRISP-DM for AI project planning
- Collaborate using GitHub and Kaggle datasets
- Build confidence with mock interviews and a mini-project