

Basics Track

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

Python for AI & Data Science

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

Mode: Live Online / Classroom

Tools & Technologies: Python, Jupyter Notebook, NumPy, Pandas, Matplotlib, Seaborn

Syllabus

Week 1

- Python refresher and environment setup
- Data types, variables, operators, loops, functions
- Overview of Python libraries ecosystem
- Assignment at end of week

Week 2

- Advanced Python: OOP, file handling, error handling
- Working with modules and packages
- Assignment at end of week

Week 3

- NumPy for numerical computing
- Arrays, indexing, broadcasting
- Assignment at end of week

Week 4

- Pandas for data manipulation
- DataFrames, joins, groupby, aggregations
- Assignment at end of week
- Mock Interview 1

Week 5

- Matplotlib & Seaborn for data visualization
- Histograms, scatter plots, heatmaps
- Assignment at end of week

Week 6

- Data wrangling & cleaning techniques
- Handling missing values, duplicates, outliers
- Assignment at end of week

Week 7

- Exploratory Data Analysis project
- EDA on real-world dataset
- Assignment at end of week

Week 8

- Applied statistics for AI
- Final project presentation
- Mock Interview 2
- Assignment at end of week

Learning Outcomes

- Master Python programming for AI/ML
- Use NumPy and Pandas for large datasets
- Clean, preprocess, and visualize data
- Apply statistics in AI projects
- Complete an EDA project and present results

Machine Learning Essentials

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

Mode: Live Online / Classroom

Tools & Technologies: Python, Scikit-learn, Jupyter Notebook

Syllabus

Week 1

- Introduction to Machine Learning concepts
- Supervised vs Unsupervised learning
- Assignment at end of week

Week 2

- Regression models: Linear, Logistic
- Hands-on with Scikit-learn
- Assignment at end of week

Week 3

- Classification: Decision Trees, Random Forest, SVM
- Assignment at end of week

Week 4

- Clustering: K-means, DBSCAN
- Evaluation metrics for clustering
- Assignment at end of week
- Mock Interview 1

Week 5

- Model evaluation: accuracy, precision, recall, F1-score
- Cross-validation techniques
- Assignment at end of week

Week 6

- Feature engineering & scaling
- Assignment at end of week

Week 7

- Hyperparameter tuning (GridSearch, RandomSearch)
- Assignment at end of week

Week 8

- End-to-end ML project
- Final project presentation
- Mock Interview 2
- Assignment at end of week

Learning Outcomes

- Understand core ML algorithms
- Implement regression, classification, and clustering models
- Evaluate models using real-world datasets
- Apply feature engineering and hyperparameter tuning
- Complete an ML project from start to finish