Artificial Intelligence & Data Science

Duration: 16 Weeks

Program Overview

Build expertise in Data Analytics, Data Science, Artificial Intelligence, Machine Learning, Database Management, Business Intelligence, and Cloud Computing. This industry-focused program combines hands-on learning, real-world projects, and cloud deployment practices to prepare learners for modern AI-driven careers.

Module 1: Data Analytics Foundations

Topics Covered

- Introduction to Data & Data Types
- Business Problem Solving
- Analytical Thinking
- Types of Analytics
- Data Collection & Preparation
- Statistical Fundamentals
- Data Cleaning & Preprocessing
- Exploratory Data Analysis (EDA)

Tools

- Microsoft Excel
- Python

Module 2: Advanced Excel for Analytics

Topics Covered

- Formulas & Functions
- Logical Functions
- VLOOKUP, XLOOKUP
- INDEX & MATCH
- Conditional Formatting
- Data Validation
- Pivot Tables
- Power Query
- Dashboard Development

- KPI Reporting

Project

- Sales & Performance Dashboard

Module 3: Statistics & Probability

Topics Covered

- Mean, Median, Mode
- Variance & Standard Deviation
- Probability Theory
- Probability Distributions
- Correlation & Covariance
- Sampling Techniques
- Hypothesis Testing
- T-Test, ANOVA, Chi-Square
- Central Limit Theorem

Applications

- Data-Driven Decision Making

Module 4: Python Programming

Topics Covered

- Python Fundamentals
- Variables & Data Types
- Operators
- Conditional Statements
- Loops
- Functions
- Data Structures
- OOP Concepts
- Exception Handling
- File Handling

Mini Project

- Student Management System

Module 5: Data Analysis with Python

Technologies

- NumPy
- Pandas
- Matplotlib
- Seaborn
- Jupyter Notebook

Topics Covered

- Data Manipulation
- Data Wrangling
- Data Cleaning
- EDA
- Feature Engineering
- Outlier Detection
- Data Visualization

Project

- Real-World Dataset Analysis

Module 6: SQL & Database Management

Topics Covered

- Database Fundamentals
- MySQL
- CRUD Operations
- Filtering & Sorting
- Aggregate Functions
- Joins
- Subqueries
- Views
- Stored Procedures
- Data Cleaning with SQL

Project

- Sales & Customer Analytics Database

Module 7: Power BI for Business Intelligence

Topics Covered

- Data Import & Transformation
- Power Query
- Data Modeling
- DAX Functions
- Interactive Dashboards
- KPI Tracking
- Data Storytelling
- Report Publishing

Project

- Executive Business Dashboard

Module 8: Machine Learning

Topics Covered

- Machine Learning Fundamentals
- ML Workflow
- Supervised Learning
    - Linear Regression
    - Logistic Regression
    - Decision Trees
    - Random Forest
    - KNN
    - SVM
- Unsupervised Learning
    - K-Means Clustering
- Feature Engineering
- Model Evaluation
- Hyperparameter Tuning

Project

- Customer Prediction Model

Module 9: Artificial Intelligence & Deep Learning

Topics Covered

- Introduction to Artificial Intelligence

- AI Applications & Industry Use Cases
- Neural Networks Fundamentals
- Deep Learning Concepts
- TensorFlow & Keras
- Artificial Neural Networks (ANN)
- Convolutional Neural Networks (CNN)
- Recurrent Neural Networks (RNN)
- LSTM Fundamentals
- AI Model Deployment Concepts

Project

- Image Classification or Prediction System

Module 10: MongoDB & NoSQL Databases

Topics Covered

- NoSQL Fundamentals
- MongoDB Architecture
- Collections & Documents
- CRUD Operations
- Aggregation Framework
- Indexing
- Schema Design
- SQL vs MongoDB

Project

- MongoDB-Based Data Management System

Module 11: Cloud Computing for AI & Data Science

Cloud Fundamentals

- Introduction to Cloud Computing
- IaaS, PaaS & SaaS
- Cloud Architecture

Amazon Web Services (AWS)

- AWS Fundamentals
- EC2 Virtual Machines
- S3 Storage
- IAM Management

- Hosting Applications

Microsoft Azure

- Azure Fundamentals
- Azure Virtual Machines
- Azure Storage Services
- Azure SQL Database

Cloud for AI & Data Science

- Dataset Storage in Cloud
- ML Model Deployment Concepts
- Cloud-Based Analytics Solutions
- AI Services Overview

Practical Activities

- Deploy Application on AWS
- Deploy Application on Azure

Module 12: Capstone Project & Industry Readiness

End-to-End Industry Project

Students will build a complete AI & Data Science solution involving:

- Problem Statement Definition
- Data Collection
- Data Cleaning
- SQL Data Extraction
- Exploratory Data Analysis
- Machine Learning Model Development
- Deep Learning Implementation
- Dashboard Creation with Power BI
- Cloud Deployment
- Final Presentation

Project Domains

- Healthcare Analytics
- Financial Analytics
- Retail Analytics
- Sales Forecasting
- Customer Segmentation
- HR Analytics

Tools & Technologies

- Microsoft Excel
- Python
- NumPy
- Pandas
- Matplotlib
- Seaborn
- Scikit-Learn
- TensorFlow
- Keras
- MySQL
- MongoDB
- Power BI
- AWS
- Microsoft Azure
- Jupyter Notebook

Career Opportunities

- Data Analyst
- Business Analyst
- Data Scientist
- AI Engineer
- Machine Learning Engineer
- Deep Learning Engineer
- Power BI Developer
- Business Intelligence Analyst
- Data Engineer
- Cloud Data Engineer
- AI Solutions Associate

Certification

Industry-Oriented Certification in Artificial Intelligence, Data Science & Cloud Computing upon successful completion of assessments, projects, and capstone presentation.