DATA SCIENCE AND DATA ANALYTICS

Module 1: Introduction to Data Science

Data Science is the field of extracting insights from data using scientific methods, processes, and algorithms. It combines statistics, programming, and domain knowledge to solve real-world problems. This module introduces the scope, roles, and significance of data science across industries.

Module 2: Data Science Workflow

The data science process follows a structured path: understanding the problem, collecting data, cleaning it, analyzing, and communicating insights. Each stage is crucial to ensure reliable results. This module outlines the step-by-step approach that professionals use to build data-driven solutions.

Module 3: Data Types and Data Sources

Understanding different data types structured, unstructured, qualitative, and quantitative—is foundational in analytics. Data can come from databases, APIs, web scraping, or files like CSV and JSON. This module focuses on identifying and accessing the right data for analysis.

Module 4: Python for Data Science

Python is the most popular programming language in data science due to its simplicity and powerful libraries like NumPy, Pandas, and Matplotlib. You'll learn how to manipulate data using DataFrames and perform basic analysis and visualizations. This module sets the coding foundation for analytics work.

Module 5: Data Cleaning and Preprocessing

Raw data is often messy, incomplete, or inconsistent, making preprocessing a vital step. You'll learn techniques to handle missing values, encode categorical variables, detect outliers, and scale data. This module ensures your data is ready for analysis or modeling.

Module 6: Exploratory Data Analysis (EDA)

EDA is the process of summarizing and visualizing datasets to understand patterns, trends, and relationships. It helps uncover initial insights and guides further analysis. This module teaches how to use statistics and plots to explore data meaningfully.

Module 7: Statistical Foundations

Statistics is the backbone of data science, enabling you to interpret data and make informed decisions. Key concepts include mean, median, variance, probability, and hypothesis testing. This module builds your ability to draw conclusions from data confidently.

Module 8: Introduction to Machine Learning

Machine Learning enables systems to learn from data and make predictions. You'll explore basic algorithms like linear regression and clustering, along with model evaluation metrics. This module provides a hands-on introduction to automating insights through learning models.

Module 9: Data Visualization and Reporting

Visualizing data helps communicate findings effectively to stakeholders. You'll learn to create charts, dashboards, and interactive visuals using tools like Matplotlib, Seaborn, Power BI, or Tableau. This module emphasizes storytelling with data for better decision-making.

Module 10: Real-World Projects and Case Studies

Applying what you've learned to real scenarios is key to mastering data science. This module walks you through full case studies such as customer segmentation or sales forecasting. It also covers project planning, presentation, and basic model deployment.

Career Scope of Learning Data Science

Data Science is one of the most in-demand and fastest-growing fields globally, driven by the exponential growth of data and the need for data-driven decision-making. Organizations across industries from finance, healthcare, and e-commerce to manufacturing, logistics, and education are investing heavily in building data capabilities.

Upon completing this course, learners can pursue roles such as:

- **Data Analyst**
- **Data Scientist**
- **Business Intelligence Analyst**
- **Machine Learning Engineer**
- **Data Engineer**
- **Quantitative Analyst**
- **AI Analyst**
- **Analytics Consultant**

Data Science skills are also highly valued in startups, research institutions, product-based companies, and government agencies. The career path is dynamic, with opportunities to transition into specialized roles in AI, deep learning, big data, or data product management.

Salary Package After Learning Data Science

The earning potential in data science varies with experience, industry, and specialization:

- **Entry-Level (0–2 years):** ₹5 to ₹8 LPA
  (Data Analyst, Junior Data Scientist)
- **Mid-Level (3–6 years):** ₹9 to ₹18 LPA
  (Data Scientist, BI Analyst, ML Engineer)
- **Senior-Level/Experts:** ₹20 to ₹40+ LPA
  (Lead Data Scientist, Analytics Head, Principal Data Engineer)

Globally, especially in the US, Canada, and Europe, data science professionals earn between **$90,000 to $160,000**+ annually, depending on their skill set and domain expertise.