

DATA ANALYSIS



e-Learning Course

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COURSE MODULES

Module 1: Introduction to Data Analysis

- *What is Data Analysis?*
- *Importance & Applications of Data Analysis*
- *Types of Data (Structured vs. Unstructured)*
- *Data Analysis Process*
- *Tools & Technologies (Excel, SQL, Python, R, Power BI, Tableau)*

Module 2: Data Collection & Cleaning

- *Data Sources (APIs, Databases, Web Scraping, Surveys)*
- *Data Collection Techniques*
- *Handling Missing Data*
- *Removing Duplicates & Outliers*
- *Data Standardization & Formatting*

Module 3: Exploratory Data Analysis (EDA)

- *Descriptive Statistics (Mean, Median, Mode, Variance)*
- *Data Visualization (Charts, Histograms, Box Plots, Scatter Plots)*
- *Identifying Trends & Patterns*
- *Correlation & Relationships*

Module 4: Data Wrangling & Transformation

- *Data Merging & Joins*
- *Aggregation & Grouping*
- *Data Reshaping (Pivot Tables, Melting)*
- *Feature Engineering*

Module 5: Statistical Analysis & Hypothesis Testing

- Probability Distributions
- Sampling Methods
- Hypothesis Testing (T-tests, Chi-Square, ANOVA)
- Confidence Intervals & Significance Levels

Module 6: Data Analysis with Python & Pandas

- Introduction to Python for Data Analysis
- Pandas for Data Manipulation
- NumPy for Numerical Computing
- Matplotlib & Seaborn for Data Visualization

Module 7: SQL for Data Analysis

- Introduction to SQL
- Writing Queries (SELECT, WHERE, JOIN, GROUP BY)
- Data Filtering & Aggregation
- Using SQL with Pandas

Module 8: Machine Learning for Data Analysis (Basic)

- Introduction to Machine Learning
 - Supervised vs. Unsupervised Learning
 - Regression Analysis
 - Classification Techniques
 - Clustering
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Module 9: Data Visualization & Reporting

- Principles of Effective Data Visualization
- Dashboard Design (Power BI, Tableau)
- Storytelling with Data
- Automating Reports

