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## Data Analytics Course Curriculum

### Module 1: Introduction to Data Analytics

- What are Data Analytics? (Descriptive, Diagnostic, Predictive, Prescriptive)
- Role of data in decision-making
- Data Analyst vs Data Scientist vs Business Analyst
- Tools used in Data Analytics (Excel, SQL, Python, Power BI, Tableau, R)
- Role of Excel & Power BI in analytics
- Differences & integration of Excel and Power BI

### Module 2: Statistics & Data Foundations

- Types of data (structured vs unstructured, categorical vs numerical)
- Data collection & sources
- Descriptive statistics (mean, median, mode, Range, variance, standard deviation)
- Probability basics
- Distributions
- Standardization, Normalization, Z-score
- Population Vs Sample, Confidence Interval
- Hypothesis testing (t-test, chi-square test, ANOVA)
- Correlation vs causation

❖ Mini Project: Analyze survey data using descriptive statistics

### Module 3: Excel Basics for Data Analytics

- Excel interface & navigation
- Data types, formatting, data validation
- Basic formulas & functions (SUM, AVERAGE, COUNT, IF, VLOOKUP/XLOOKUP, INDEX, MATCH)
- Named ranges & structured references

❖ Hands-on: Create a sales tracker using Excel

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#### Module 4: Data Cleaning & Preparation

- Sorting & filtering data
- Removing duplicates & blanks
- Text functions (LEFT, RIGHT, MID, TRIM, CONCAT, TEXTJOIN)
- Date & time functions
- Flash Fill & Quick Analysis tools

📌 Hands-on: Clean raw HR data for analysis

#### Module 5: Exploratory Data Analysis in Excel

- Conditional formatting
- PivotTables & PivotCharts
- Grouping & summarizing data
- Calculated fields in PivotTables
- Slicers & timelines

📌 Hands-on: Build a sales dashboard using PivotTables

#### Module 6: Advanced Excel for Analytics

- Advanced formulas (ARRAY formulas, IFERROR, SUMPRODUCT)
- Dynamic arrays (FILTER, SORT, UNIQUE, SEQUENCE)
- What-If Analysis (Scenario Manager, Goal Seek, Data Tables)
- Solver for optimization
- Excel Tables & structured references

📌 Hands-on: Perform financial forecasting using What-If Analysis

#### Module 7: Data Visualization in Excel

- Best practices for charts (bar, line, pie, combo, waterfall)
- Sparklines & conditional formatting for dashboards
- Interactive dashboards with form controls

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- KPIs with Excel charts
- ❖ Hands-on: Create an interactive management dashboard in Excel

#### Module 8: SQL for Data Analytics

- Introduction to databases & SQL
- SELECT, WHERE, ORDER BY
- Aggregate functions (SUM, COUNT, AVG, MAX, MIN)
- GROUP BY, HAVING
- Joins (INNER, LEFT, RIGHT, FULL)
- Subqueries & CTEs
- Window functions (RANK, ROW\_NUMBER, PARTITION BY)

- ❖ Mini Project: Query a sales database to find top-performing products

#### Module 9: Introduction to Power BI

- Power BI ecosystem (Desktop, Service, Mobile, Gateway)
- Data analytics workflow in Power BI
- Connecting Power BI with Excel & databases

#### Module 10: Power BI Data Preparation (Power Query)

- Importing data from multiple sources
- Data cleaning & transformation with Power Query Editor
- M Language basics
- Combining multiple queries (merge, append)

- ❖ Hands-on: Prepare and clean raw sales data

#### Module 11: Data Modeling in Power BI

- Data relationships (1-to-1, 1-to-many, many-to-many)
- Star vs snowflake schema
- Calculated columns & measures
- DAX (Data Analysis Expressions) basics

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- Aggregation functions (SUM, COUNT, AVERAGE)
- Time intelligence (YTD, MTD, QTD)
- Filter functions (CALCULATE, FILTER, ALL)

❖ Hands-on: Build a sales model with DAX measures

#### Module 12: Data Visualization in Power BI

- Charts & visuals (bar, line, scatter, pie, tree map, waterfall, map)
- Custom visuals & marketplace
- Formatting visuals & reports
- Bookmarks, drill-through, tooltips
- Dashboards vs reports

❖ Hands-on: Create an interactive sales dashboard with drill-downs

#### Module 13: Advanced Analytics in Power BI

- KPIs & scorecards
- Forecasting & trend lines
- Decomposition tree
- Q&A (natural language queries)
- Row-level security (RLS)

❖ Hands-on: Build a financial forecast dashboard with RLS

#### Module 14: Power BI Service & Collaboration

- Publishing reports to Power BI Service
- Workspaces & apps
- Sharing reports & dashboards securely
- Scheduled refresh & data gateways
- Power BI with Microsoft Teams & Excel

❖ Hands-on: Publish a dashboard & set up scheduled refresh

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### Module 15: Advanced Analytics Concepts

- Time series analysis (trends, seasonality, moving averages)
- Forecasting techniques
- Clustering & segmentation (K-means basics)
- Regression analysis (linear, logistic)
- Introduction to machine learning for analysts

📌 Mini Project: Forecast monthly sales using time series analysis

### Module 16: Big Data & Cloud Analytics (Introductory)

- Basics of Big Data (Hadoop, Spark overview)
- Cloud data platforms (AWS, Azure, Google BigQuery)
- Connecting BI tools to cloud data sources

### Module 17: Soft Skills for Data Analysts

- Problem-solving & critical thinking
- Business domain knowledge (finance, marketing, HR, operations)
- Communication & storytelling with data
- Writing effective reports

### Module 18: Capstone Projects

- **Retail Analytics Project** → Analyze sales & customer data, create dashboards
- **HR Analytics Project** → Predict attrition & create workforce reports
- **Finance Analytics Project** → Budget forecasting & variance analysis
- **Marketing Analytics Project** → Campaign performance analysis