



Data Analytics Training Course

CURRICULUM

Module I – Introduction to Data Analytics

- What is data analytics & its lifecycle
- Analytical thinking & decision frameworks
- Types of analytics: descriptive, diagnostic, predictive, prescriptive
- Data analyst vs data scientist vs business analyst
- Key roles and responsibilities in the analytics ecosystem
- Real-world analytics pipeline (data → insight → decision)
- Importance of data-driven culture in business
- Tools and technologies overview in modern analytics
- Understanding business problems and converting them into analytical questions

Module II – Database Fundamentals

- What is a database and its role in analytics
- Relational vs non-relational databases
- Tables, records, keys, and relationships
- Database design and normalization
- ER diagrams and schema structure
- CRUD operations (Create, Read, Update, Delete)
- Data constraints and referential integrity
- Data warehousing basics
- Connecting Python, Tableau, and Power BI to databases

Module III – SQL for Analysts

- Understanding databases, schemas, and tables
- SELECT, WHERE, ORDER BY, GROUP BY, and HAVING clauses
- Data extraction and transformation using joins and subqueries
- Window functions (RANK, ROW_NUMBER, LAG, LEAD)
- Common Table Expressions (CTEs) for complex queries
- Aggregations, nested queries, and date/time manipulations
- Creating and using views for analytics
- SQL query optimization and indexing basics
- Real-world analytics use cases and mini-projects

Module IV – MySQL for Data Analytics

- Setting up MySQL and MySQL Workbench
- Writing and executing analytical queries
- Importing/exporting datasets (CSV, JSON)
- Stored procedures, triggers, and views
- User roles, permissions, and data security
- MySQL indexing and performance tuning
- Integrating MySQL with Tableau and Power BI

Module V – NoSQL for Data Analytics

- What is NoSQL and why it emerged
- Limitations of relational databases for modern data
- Core NoSQL database types: Document-based, Key-Value, Column-family, Graph
- Differences between SQL and NoSQL (schema, scaling, flexibility)
- CAP theorem and BASE properties
- Data modeling strategies in NoSQL systems
- When to choose NoSQL over SQL in analytics workflows
- Overview of popular NoSQL databases (MongoDB, Cassandra, Redis, Neo4j)
- Connecting NoSQL systems to analytics tools

Module VI – MongoDB for Data Analytics

- Introduction to MongoDB and BSON structure
- Core components: databases, collections, documents, indexes
- Installing and setting up MongoDB & MongoDB Compass
- CRUD operations (insertOne, find, updateOne, deleteOne)
- Advanced queries and filtering
- Aggregation pipelines for analytical transformations
- Data modelling and schema design for analytics
- Indexing and performance tuning in MongoDB
- Integrating MongoDB with Python (PyMongo and Pandas)

Module VII – Python for Data Analytics

- Introduction to Python and Jupyter Notebooks
- Variables, control structures, and functions
- Working with files (CSV, JSON, Excel)
- Handling APIs and JSON data
- Using virtual environments and packages
- Automating data workflows
- Integrating Python with BI tools

Module VIII – NumPy for Numerical Computing

- Introduction to NumPy and its role in data analytics
- Creating and manipulating NumPy arrays
- Indexing, slicing, reshaping, and stacking arrays
- Understanding array data types and memory efficiency
- Vectorised operations and broadcasting
- Mathematical and statistical operations on arrays
- Random number generation and reproducibility
- Working with multi-dimensional (nD) data
- Integration of NumPy with Python and pandas

Module IX – Pandas for Data Manipulation

- Introduction to pandas and its importance in analytics
- Working with Series and DataFrames
- Importing and exporting datasets (CSV, Excel, JSON)
- Data inspection and exploration (info(), describe(), etc.)
- Data cleaning: handling missing values and duplicates
- Filtering, sorting, and conditional selections
- Grouping, aggregating, merging, and joining datasets
- Feature engineering and date-time operations
- Combining pandas with NumPy for advanced analysis

Module X – Matplotlib & Seaborn for Visualization

- Basics of Matplotlib plotting
- Seaborn for advanced statistical visuals
- Creating bar, line, scatter, heatmap, and box plots
- Customizing charts (titles, labels, grids, colors)
- Subplots and multiple visual layouts
- Storytelling through visuals
- Automating reporting with Python scripts

Module XI – Statistics for Data Analytics

- Introduction to Statistics
- Types of Statistics
- Types of Data
- Levels of Data Measurement
- Mean
- Median
- Mode
- Variance
- Standard Deviation
- Probability

Module XII – Data Cleaning & Pre-processing

- Identifying missing values and imputation techniques
- Outlier detection using statistical and visual methods
- Data normalization and standardization
- Encoding categorical variables (label, one-hot, ordinal encoding)
- Dealing with inconsistent data and duplicates
- Date-time formatting and time-series alignment
- Feature scaling and transformation
- Data validation and integrity checks
- Maintaining data quality across pipelines

Module XIII – Exploratory Data Analysis (EDA)

- What is EDA and why it's essential in analytics
- EDA process: understanding data → cleaning → exploring → interpreting
- Univariate analysis (distributions, histograms, box plots)
- Bivariate and multivariate analysis (correlation, scatter, pair plots)
- Identifying outliers and anomalies visually and statistically
- Data summarization using descriptive statistics
- Feature distributions and skewness detection
- Handling categorical vs numerical data
- Using pandas, Matplotlib, and Seaborn for EDA
- Project: Perform full EDA on a real-world dataset (sales, HR, or e-commerce)

Module XIV – Data Visualization

- Best practices in data visualization and storytelling
- Choosing the right visualization type for your data
- Data-to-insight storytelling with visuals
- Using Power BI, Tableau, or Looker for professional dashboards
- Interactive filters, drill-downs, and slicers
- Designing for non-technical audiences
- Visual perception and color psychology in dashboards
- Avoiding misleading or biased visuals
- Creating automated, real-time dashboards

Module XV – PowerBI (BI) Tools

- Power BI: DAX formulas, data modeling, and relationships
- Power Query for data transformation in BI
- Tableau: calculated fields, filters, parameters, and blending data sources
- Google Data Studio basics and integrations
- Dashboard design principles for executives
- Data refresh automation and scheduling
- Role-based dashboard access and permissions
- Embedding BI reports into business workflows
- Connecting BI tools to APIs and cloud databases

Module XVI – Tableau for Advanced Data Analytics

- Tableau interface, workspace, and data connection setup
- Data blending vs data joinin
- Tableau Prep for ETL (cleaning, merging, reshaping data)
- Dimensions, measures, and calculated fields
- Table calculations and level of detail (LOD) expressions
- Dynamic parameters and user-driven interactivity
- Advanced visualizations (heatmaps, treemaps, waterfall, box plots, bullet charts)
- Creating multi-source dashboards (Excel + SQL + API data)
- Story points for narrative data storytelling

Module XVI – Tableau for Advanced Data Analytics

- Dashboard actions (filter, highlight, URL, and sheet swapping)
- Performance optimization and data extracts vs live connections
- Publishing dashboards to Tableau Server and Tableau Cloud

Module XVII – Advanced Excel & Power Query

- Combining data from multiple workbooks & sources
- Using Power Query for ETL (Extract, Transform, Load)
- Advanced formulas with dynamic arrays (FILTER, SORT, UNIQUE)
- Dashboard interactivity with form controls & buttons
- Forecasting using Excel functions (TREND, FORECAST, LINEST)
- Creating scenario analysis models & sensitivity analysis
- Automating recurring reports with Power Query refresh
- Linking Excel with Power BI for hybrid dashboards
- Building Excel-based analytics projects

Module XVIII – Business Analytics & KPI Reporting

- Introduction to Business Analytics
- Key Performance Indicators (KPIs)
- Types of Business Metrics
- Sales & Revenue Analytics
- Customer Analytics
- Marketing Performance Analytics
- Financial & Operational KPIs
- KPI Dashboard Design
- Business Report Creation & Interpretation
- Data-Driven Decision Making

Module XIX – Data-Driven Decision Making

- Identifying and defining KPIs & metrics
- Root cause analysis and problem framing
- Business experimentation and A/B testing
- Decision frameworks: RICE, ICE, Pareto analysis
- Communicating insights with data storytelling
- Building executive summaries from analytics findings
- Aligning insights with business goals
- Measuring ROI and performance impact
- Turning analytics into actionable strategies

Module XX – Automation & Scripting

- Automating Excel workflows with VBA macros
- Using Python scripts to refresh reports automatically
- Integrating Google Sheets with APIs
- Automating BI dashboards with Power Automate or Zapier
- Sending automated email reports
- Scheduling jobs with Task Scheduler or Airflow
- Building reusable analytics scripts
- Version control and collaboration with Git
- Minimizing manual effort through smart automation

Module XXI – Domain Analytics

- Marketing analytics: campaign tracking, ROI, funnel metrics
- Financial analytics: budgeting, forecasting, variance analysis
- HR analytics: employee attrition, engagement, hiring metrics
- Operations analytics: process optimization, cost reduction
- Sales analytics: pipeline performance, conversion ratios
- E-commerce analytics: customer segmentation, basket analysis
- Product analytics: feature adoption, retention etc.
- Supply chain analytics: demand forecasting and logistics
- Healthcare, education & fintech analytics examples

Thank You!

Thank you for downloading our curriculum!

We're excited to be part of your learning journey. Feel free to reach out if you need more information.

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