

PROFESSIONAL DIPLOMA

DATA ANALYSIS PROFESSIONAL DIPLOMA

Prepare

Analyze

Visualize

Communicate

From raw data to business insights using Excel, SQL, Power BI, Python and AI-assisted analysis.

Excel

SQL

Power BI

Python

AI Analysis

About the Diploma

A practical, end-to-end program designed to build job-ready data analysis skills.

A practical, end-to-end program designed to build job-ready data analysis skills — from data collection and cleaning to analysis, visualization, reporting, business insights and portfolio-ready projects.

01

Analyze Real Data

Work with realistic datasets and turn business questions into measurable analysis tasks.

02

Master Core Tools

Build applied skills in Excel, SQL, Power BI and Python across one connected learning journey.

03

Build Business Insight

Define KPIs, identify trends and patterns, and translate numbers into clear recommendations.

04

Create Portfolio Projects

Complete tool-based projects and an integrated capstone that demonstrates end-to-end analytical thinking.

Learning approach

Concepts → guided practice → business cases → projects → final integrated capstone.

Curriculum Overview

01

Data Analysis Fundamentals

Business questions, KPIs, data quality, analysis lifecycle and analytical thinking.

02

Excel for Data Analysis

Formulas, lookups, cleaning, Power Query, PivotTables, charts and dashboards.

03

SQL for Data Analysis

Filtering, aggregation, JOINS, subqueries, CTEs, window functions and business reporting.

04

Power BI for Data Analysis

Power Query, data modeling, DAX, interactive reports and publishing.

05

Python for Data Analysis

Python fundamentals, NumPy, Pandas, data cleaning, transformations and visualization.

06

Statistics, EDA & Advanced Analytics

Descriptive statistics, outliers, correlation, trends, preprocessing and segmentation.

07

Business Analysis & Storytelling

Business KPIs, evidence-led insights, executive summaries and recommendations.

08

Career & Portfolio Preparation

GitHub basics, case studies, CV, interviews and presenting analytical work.

09

AI for Data Analysis

AI prompts and assisted workflows across Excel, SQL, Python and Power BI. Verify outputs, protect data and build reliable insights.

Human judgment + AI support + independent validation

Data Analysis Fundamentals

Build the business and analytical foundation required before working with tools.

Core Concepts

- What is Data Analysis?
- Why Data Analysis matters in the job market
- Role and responsibilities of a Data Analyst
- Data Analytics vs Data Science
- Structured, semi-structured and unstructured data

Analysis Thinking

- Data analysis lifecycle: collect, clean, transform, analyze, visualize, report
- Descriptive, Diagnostic, Predictive and Prescriptive analysis
- Business questions, KPIs and performance metrics
- Data quality principles and quality checks
- Critical thinking and problem-solving

Statistics Preview

Center

Mean • Median • Mode

Variation

Range • Variance •
Standard Deviation

Relationships

Correlation • Patterns •
Trends

Outcome

Students can frame a business problem, identify the required data and define the metrics needed before choosing a tool.

Foundations, Formulas & Functions

Build a solid Excel foundation for cleaning, calculating and exploring business data.

Excel Foundations

- Excel interface, workbooks, worksheets, rows, columns, cells and ranges
- Data types, formatting and basic data organization
- Sort, Filter and Excel Tables
- Formula structure and cell references
- Relative, absolute and mixed references

Core Functions

- SUM, AVERAGE, COUNT, COUNTA, MIN, MAX
- IF, IFS, AND, OR
- SUMIF / SUMIFS
- COUNTIF / COUNTIFS
- AVERAGEIF / AVERAGEIFS

Text & Data Preparation Functions

Text Cleanup

TRIM • CLEAN • LEN • UPPER • LOWER • PROPER

Text Extraction

LEFT • RIGHT • MID • FIND • SEARCH

Text Transformation

SUBSTITUTE • REPLACE • CONCAT • TEXTJOIN

Practical Use

Standardize names, split codes, validate lengths and prepare inconsistent text for analysis.

Practice

Apply formulas and functions to a real sales or operations dataset and build a reusable calculation layer.

Lookups, Cleaning & Analysis

Turn raw worksheets into reliable analysis-ready data and flexible reporting models.

Lookup & Retrieval

- VLOOKUP and HLOOKUP
- XLOOKUP
- INDEX + MATCH
- Exact vs approximate matching
- Error handling and lookup quality checks

Data Cleaning & Quality

- Remove duplicates
- Handle missing and inconsistent values
- Formatting and Data Validation
- Conditional Formatting
- Quality checks before analysis

Analysis with PivotTables

PivotTables

Summarize large datasets, group dimensions and calculate business totals quickly.

Pivot Charts

Turn PivotTable summaries into charts and understand when each chart is appropriate.

Slicers & Timelines

Create interactive filters for fast exploration and reporting.

Data Visualization

Choose clear charts, organize visuals and improve the overall presentation of analysis.

Practice

Clean a messy dataset, validate data quality, build lookup logic and produce a PivotTable-based KPI report.

Power Query, Dashboard & Project

Automate repeatable data preparation and transform Excel analysis into a structured reporting workflow.

Power Query in Excel

- Import from Excel, CSV and folders
- Data types, remove/keep rows and columns
- Split and merge columns, Fill and Replace Values
- Pivot and Unpivot
- Append, Merge and Combine Files from Folder
- Refreshable transformation workflow

Reporting & Dashboarding

- KPI selection and summary reporting
- Charts and visual hierarchy
- Interactive dashboard with PivotTables, charts and slicers
- Connect Excel to Power BI
- Data Model & DAX preview as a bridge to Power BI

Excel Project

End-to-End Excel Business Case

- Import and clean raw data
- Apply formulas, lookup logic and validation
- Define KPIs and analyze results with PivotTables
- Create a professional dashboard and summarize business insights

Excel Module Outcome

Students can take a raw dataset from import to cleaning, analysis, KPI reporting and dashboard presentation using a repeatable workflow.

03

SQL Fundamentals

Build a strong foundation in relational databases, query structure, filtering, sorting and the core SQL commands used in day-to-day data analysis.

01

Database Foundations

- What is SQL?
- Database & DBMS concepts
- Tables, rows, columns and relationships
- Primary Keys & Foreign Keys
- Relational database concepts

02

Core Query Structure

- SELECT & FROM
- DISTINCT
- WHERE
- ORDER BY
- TOP

03

Filtering Data

- AND, OR, NOT
- BETWEEN
- IN
- LIKE
- NULL handling

04

Hands-on Practice

- Employee database queries
- Sales database queries
- Filtering and sorting business records
- Building clean result sets for analysis

Practical Outcome: Write clear SQL queries to retrieve, filter and sort structured business data with confidence.

03

SQL Intermediate

Move from single-table queries to grouped analysis, multi-table reporting and more realistic business questions.

01

Aggregation

- SUM, COUNT, AVG, MIN, MAX
- GROUP BY
- HAVING vs WHERE
- Grouped KPI calculations

02

JOINS

- INNER JOIN
- LEFT JOIN
- RIGHT JOIN
- FULL JOIN
- Self Join concept

03

Subqueries

- Subqueries in filtering
- Nested logic for analysis
- Comparing values with aggregated results

04

Reporting Practice

- Multi-table reports
- Sales summaries
- Customer and product analysis
- Business-ready query outputs

Practical Outcome: Combine multiple tables and summarize data to answer business questions and prepare reporting datasets.

03

Advanced SQL & Business Cases

Use advanced SQL techniques for ranking, time-based analysis, reusable query logic and KPI-driven business reporting.

01

Advanced Query Techniques

- CTEs / WITH
- CASE WHEN
- Date functions
- String functions

02

Window Functions

- ROW_NUMBER
- RANK & DENSE_RANK
- LAG & LEAD
- PARTITION BY
- Running totals

Business Analysis Cases

Monthly Revenue

Top Products

Sales Growth

Average Order Value

Employee Performance

Customer Segmentation

Customer Retention

YoY Analysis

Ranking

KPI Reporting

SQL Business Project

Build a complete analytical report from a relational database: extract and join data, calculate KPIs, rank performance, analyze trends and prepare a clean dataset for dashboarding.

Practical Outcome: Use SQL as an analytics tool—not just a query language—to produce management-ready insights and reporting datasets.

04

Power BI Fundamentals & Power Query

Learn the Power BI workflow from connecting to data through cleaning and transformation, with Power BI as the primary BI platform.

01

Power BI Ecosystem

- Power BI Desktop & Service
- Analytics workflow
- BI landscape overview: Power BI, Tableau, Looker & Google Data Studio
- Connect Excel to Power BI

02

Get Data

- Excel, CSV & Text
- Folder
- SQL Server
- Web & multiple sources
- Refresh concepts

03

Power Query

- Data types
- Remove / keep rows
- Split & merge columns
- Fill & replace values
- Conditional / custom columns

04

Combine & Reshape

- Merge queries
- Append queries
- Pivot / Unpivot
- Folder combine
- Prepare analysis-ready tables

Practical Outcome: Connect to different sources and build a repeatable Power Query cleaning workflow without changing the original source data.

04

Data Modeling & DAX

Build reliable data models and create measures that turn raw tables into business KPIs and analytical logic.

01

Data Modeling

- Fact & Dimension tables
- Primary & Foreign Keys
- Relationships
- Cardinality & filter direction
- Star Schema
- Snowflake basics
- Date Table

02

DAX Foundations

- Calculated Columns vs Measures
- SUM, SUMX
- COUNTROWS, DISTINCTCOUNT
- DIVIDE
- IF & SWITCH
- RELATED

Filter Context & Core Functions

CALCULATE

FILTER

ALL

VALUES

SELECTEDVALUE

Time Intelligence

YTD

MTD

QTD

Previous Year

YoY

Growth %

Practical Outcome: Create a clean analytical model and write reusable DAX measures for KPIs, comparisons and time-based analysis.

04

Visualization, Service & Power BI Project

Design professional interactive reports, improve user experience and publish analytical work for online consumption.

01

Visuals

- Charts, Cards & KPIs
- Table & Matrix
- Slicers
- Tooltips
- Drill-down
- Drill-through

02

Interaction & UX

- Bookmarks
- Navigation
- Layout & visual hierarchy
- Color usage
- Choosing the right chart
- Dashboard storytelling

03

Power BI Service

- Publish online
- Workspace concepts
- Sharing concepts
- Refresh & Gateway concepts
- Real-time reporting concepts

04

Power BI Project

- Get Data
- Power Query cleaning
- Data Model
- DAX measures
- Interactive dashboard
- Publish & present insights

05

Python Fundamentals

Learn the Python language features a data analyst needs before working with analytical libraries and real datasets.

01

Core Syntax

- Variables
- Numbers & Strings
- Lists & Tuples
- Sets & Dictionaries

02

Control Flow

- if / elif / else
- for loops
- while loops
- Logical conditions

03

Reusable Code

- Functions
- Lambda
- Modules & imports
- Error handling basics

04

OOP Basics

- Classes & objects
- Attributes & methods
- Why OOP matters
- Right-sized analyst use cases

Practice: Build small data-driven programs to strengthen logic before moving into NumPy and Pandas.

05

NumPy & Pandas

Use the main Python libraries for loading, exploring, filtering, grouping and transforming structured data.

01

NumPy

- Arrays
- Indexing & filtering
- Mathematical operations
- Aggregation

02

Pandas Foundations

- Series & DataFrames
- Read CSV / Excel
- Explore rows, columns & data types
- Selection & filtering
- Sorting

Grouping & Combining

GroupBy

Aggregation

Merge

Join

Concatenate

Pivot

Custom Transformations

Apply

Lambda

Custom Functions

String Operations

Date Operations

05

Cleaning, Visualization & Python Project

Turn messy data into an analysis-ready dataset, then explore and communicate findings with Python visualizations.

01

Data Cleaning

- Missing values
- Duplicates
- Type conversions
- Incorrect values
- String cleaning
- Date handling

02

Visualization

- Matplotlib
- Seaborn
- Bar & Line charts
- Pie & Scatter
- Histogram & Boxplot
- Heatmap

03

Visual Storytelling

- Choose the right chart
- Labels & formatting
- Distribution analysis
- Correlation visuals
- Export visual reports

04

Python Project

- Load a messy dataset
- Clean & transform
- Explore with EDA
- Create visual findings
- Present business insights

06

Exploratory Data Analysis & Statistics

Use descriptive statistics and exploratory techniques to understand patterns, distributions, relationships and data quality before drawing conclusions.

01

Descriptive Statistics

- Mean, Median, Mode
- Range
- Variance
- Standard Deviation
- Percentiles

02

EDA Concepts

- Distribution
- Outliers
- Correlation
- Correlation vs Causation
- Trend identification

03

Preprocessing

- Feature scaling concepts
- Standardization
- Normalization
- Preparing data for analytical models

04

Analytical Thinking

- Ask the right questions
- Validate assumptions
- Investigate anomalies
- Connect numbers to business context

Advanced Analytics Concepts

Extend descriptive analysis into trends, segmentation and introductory predictive thinking —without turning the diploma into a Data Science program.

01

Performance Analysis

- KPIs & performance metrics
- Trend analysis
- Period-over-period comparison
- Business variance analysis

02

Segmentation

- Customer segments
- Product / branch segments
- Cohort analysis concepts
- Comparative analysis

03

Predictive Concepts

- Basic Predictive Analysis
- Forecasting concepts
- Simple Linear Regression
- Predictive vs Descriptive

04

Decision Support

- Interpret analytical results
- Recognize limitations
- Avoid overclaiming
- Translate findings into actions

Scope: The goal is analytical literacy and business application—not machine learning specialization.

07

From Business Problem to Analysis

Develop the thinking process that turns a vague management request into clear questions, metrics and an analytical plan.

1

Define the Business Problem

Clarify the decision, pain point or performance issue.

2

Translate It into Questions

Break the problem into measurable analytical questions.

3

Select KPIs & Metrics

Choose measures that reflect the objective and business context.

4

Analyze & Validate

Find patterns, compare segments, test assumptions and investigate anomalies.

5

Form Insights & Recommendations

Explain what happened, why it matters and what should happen next.

07

Insights, Recommendations & Storytelling

Communicate analysis so that decision makers can understand the evidence, impact and recommended action.

01

Insight Structure

- Evidence
- Interpretation
- Business Impact
- Recommendation
- Supporting numbers

02

Executive Communication

- Executive summary
- Reports
- Presentation structure
- Presenting to management
- Clear visual narrative

Example of a Strong Business Insight

“Revenue increased 14%, driven mainly by Cairo and Electronics, while the return rate in Category X increased and requires investigation.”

Goal: Move beyond describing charts. Explain the business meaning of the numbers and recommend a clear next step.

08

Career & Portfolio Preparation

Package your technical work into a portfolio that recruiters, clients and interviewers can understand.

01

Portfolio Foundations

- GitHub basics for analysts
- Organize project files
- Write clear project descriptions
- Build case-study style summaries

02

Professional Presence

- Present projects on LinkedIn
- Write CV project bullets
- Explain tools and business impact
- Show end-to-end workflow

03

Interview Preparation

- Excel questions
- SQL questions
- Power BI questions
- Project explanation

04

Professional Skills

- Critical thinking
- Problem solving
- Communication
- Practical guidance & learner/client interaction

09

AI-Assisted Data Analysis

Use AI tools such as ChatGPT and Copilot to accelerate analytical work, while keeping the analyst responsible for accuracy.

01

Prompts & Analytical Thinking

- Turn management requests into questions
- Describe datasets, metrics and context
- Write clear prompts and verify assumptions

02

AI with Excel & SQL

- Explain and troubleshoot Excel formulas
- Support cleaning and Power Query logic
- Draft SQL JOINS, KPIs and reporting queries

03

AI with Python & Power BI

- Support Pandas cleaning and EDA
- Review DAX measures and report logic
- Turn analysis into well-supported insights

04

Validation, Ethics & Privacy

- Recheck calculations, filters and totals
- Detect invented or unsupported outputs
- Safeguard confidential business data

PRACTICE: REALISTIC BUSINESS CASE

Use AI support to inspect a messy sales export, plan cleaning, draft KPI calculations and validate the results independently before writing a management insight.

KEY RULE AI assists the analyst; it never replaces data validation.

What You Will Be Able to Do

By the end of the diploma, learners should be able to move from raw business data to clear, actionable analytical outputs.

Technical Skills

- Clean and analyze data in Excel
- Query relational databases with SQL
- Build Power BI data models and DAX measures
- Clean, transform and visualize data with Python
- Apply descriptive statistics and EDA
- Use AI responsibly and check its output

Business Skills

- Define analytical questions
- Select useful KPIs
- Interpret performance
- Find patterns and problems
- Write insights and recommendations
- Present findings clearly

Applied Learning Outcome

Apply practical analysis workflows to business datasets, validate KPIs, and present evidence-based insights using modern analysis tools and AI support.

DATA ANALYSIS PROFESSIONAL DIPLOMA

From Raw Data to Business Decisions

Excel · SQL · Power BI · Python · Statistics · Data Storytelling
AI-Assisted Data Analysis

Build the skill. Apply the workflow. Tell the story.

A practical learning journey designed around real analytical tasks and portfolio-ready outcomes.