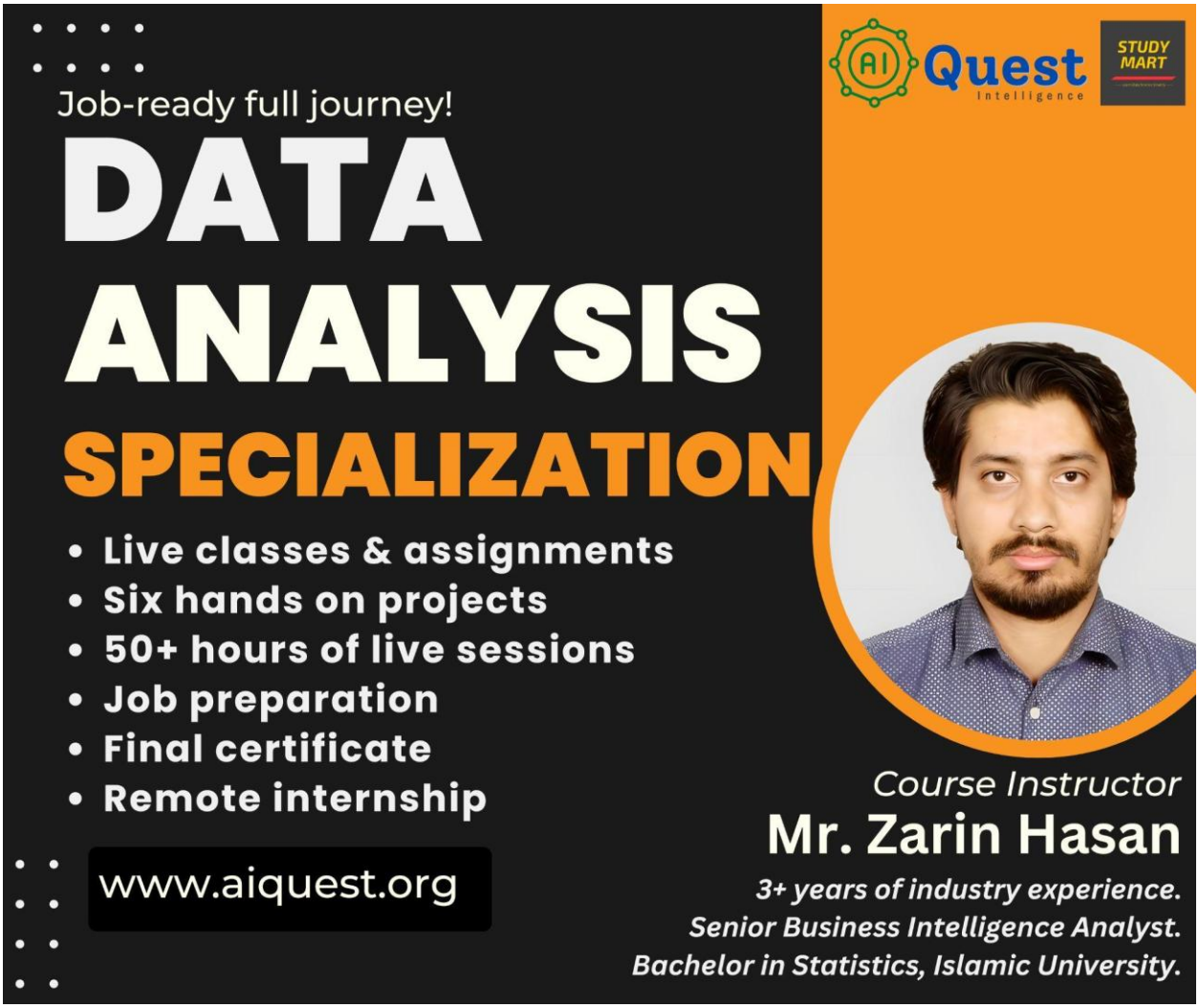
Data Analysis Specialization

(Junior Data Analyst / BI Analyst Job Ready Program)

(Website: www.aiquest.org, Cell: +8801704265972)



Watch the Course Plan & Demo Class!

- The total number of projects is **six**.
- We will offer a remote internship to the top **five learners** based on performance.

এক নজরে কোর্স মডিউল:

❖ Introduction to Data Analytics

Get acquainted with the fundamentals of data analytics and understand its importance in today's data-driven world.

❖ No-Code Data Analysis:

1. Statistics for Data Analytics

Learn how statistics provides the tools and techniques needed to make sense of large amounts of data, draw meaningful insights, and make informed decisions in data analytics.

2. Data Analytics with Excel

Learn how to perform data analysis using Microsoft Excel, a powerful tool for organizing, analyzing, and visualizing data.

3. Data Analytics with Google Spreadsheet

Learn how to perform data analysis using Google spreadsheet, a cloud-based spreadsheet application developed by Google for organizing, analyzing, and visualizing data.

4. Dive into Power BI

Gain proficiency in Power BI, a leading business analytics tool for creating interactive reports and dashboards.

5. Data Preparation & Visualization with Tableau

Learn how to prepare and clean data for analysis, and create stunning visualizations using Tableau, a popular data visualization tool.

6. Data Visualization with Looker Studio

Discover how to create compelling and interactive reports with Looker Studio, a user-friendly visualization tool.

❖ With - Code Data Analysis:

1. SQL (MySQL / PostgreSQL)

Master the skills of Structured Query Language (SQL) with a focus on MySQL and PostgreSQL, which are essential for data manipulation and retrieval from databases.

2. Exploratory Data Analysis with Python

This module aims to provide a deep dive into the techniques and tools for conducting thorough exploratory data analysis (EDA) using Python.

❖ Job, Internship & Freelancing Guidance with CV & Resume

- Receive expert guidance on crafting an effective CV and resume, along with insights into job opportunities and freelancing in the field.

Module 01: Introduction to Data Analytics (Duration: 1.50 hours)

- ❖ Understanding the Intersection of Business and Data
- ❖ Key Terminology Demystified
- ❖ Contrasting Data Analyst Roles with Other Data Professions
- ❖ Deconstructing the Data Analyst Role Description
- ❖ Data Analyst Responsibilities
- ❖ Data Analyst Vs. Data Engineers Vs. Data Scientists
- ❖ Do we need statistics for data analytics?
- ❖ External Resource Sharing
- ❖ Real Life Experience Sharing

Module 02: Statistics for Data Analytics (Duration: 8 Hours)

❖ Descriptive Statistics (Core of Exploratory Data Analysis)

1. **Introduction to Descriptive Statistics**
- Definition & Purpose
- Application for Analysts

2. **Measures of Central Tendency**
- Mean, Median, Mode

3. **Measures of Variability (Dispersion)**
- Variance & Standard Deviation
- Coefficient of Variation (C.V)

4. **Data Distribution & Shape**
- Understanding Distribution
- Skewness
- Kurtosis

❖ Probability & Distributions (Foundation for Inference & Prediction)

1. **Probability Fundamentals**
- Basic Concepts
- Probability Rules
- Conditional Probability
- Bayes' Theorem

2. **Random Variables & Expectations**
- Random Variable
- Expectation (Mean of RV)
- Variance of RV

3. **Common Probability Distributions (Most Used in Analytics)**

- Normal Distribution
- Bernoulli Distribution
- Binomial Distribution
- Poisson Distribution

❖ Data Visualization for Statistical Analysis

1. **Choosing the Right Visualization**

- Bar Charts
- Histograms
- Scatter Plots
- Box Plots

2. **Interpreting Visualizations**

- Extracting Patterns
- Comparing Groups.
- Validating Statistical Assumptions

❖ Hypothesis Testing

1. **Introduction to Hypothesis Testing**

- Definition & Purpose
- Formulating Hypotheses
  - Null Hypothesis (H_0)
  - Alternative Hypothesis (H_1)
- Type I Error (α)
- Type II Error (β)
- p-Value

2. **Common Hypothesis Tests**

- t-Tests
  - One-sample t-Test
  - Independent Two-sample t-Test
  - Paired t-Test
- Chi-Square Tests
- ANOVA (Analysis of Variance)

- Assignments on Statistics

Module 03: Data Analytics with Excel (Duration: 8 hours)

1. **Core Excel Fundamentals**

- Excel interface, navigation, worksheets & workbooks
- Cell references (absolute vs. relative)
- Data entry, formatting (number, date, text styles)
- Basic math & stats: SUM, AVERAGE, COUNT, MAX, MIN

2. **Data Cleaning & Preparation**

- Sorting & filtering efficiently
- Removing duplicates & handling blanks/missing data
- Text-to-columns, TRIM, PROPER, CLEAN, SUBSTITUTE
- Import/export: CSV, TXT, Excel files
- Intro to Power Query

3. **Essential Functions**

- Logical: IF, IFS, AND, OR, NOT.
- Lookup: XLOOKUP, VLOOKUP, HLOOKUP, INDEX+MATCH.
- Date/Time: TODAY, NOW, DATEDIF, EOMONTH, NETWORKDAYS.
- Text: LEFT, RIGHT, MID, CONCAT, TEXT, FIND, LEN.
- Error handling: IFERROR, ISNA.

4. **Data Summarization with PivotTables**

- Creating PivotTables & grouping data
- Value field settings: SUM, COUNT, % of Total, Running Total
- PivotCharts for visualization
- Adding Slicers/Timelines for interactivity

5. **Data Visualization & Reporting**

- Charts: column, bar, line, combo, waterfall
- Conditional formatting: data bars, icon sets, color scales
- Sparklines for compact trends
- Dashboard design principles (clarity, storytelling, interactivity)
- Exporting reports (PDF, CSV, presentations)

6. **Advanced Functions & Analysis**

- Nested formulas & logical operations
- Conditional functions: COUNTIF(S), SUMIF(S), AVERAGEIF(S)
- Dynamic arrays: SORT, FILTER, UNIQUE
- Look up across multiple criteria (INDEX-MATCH or XLOOKUP combos)

7. **Power Query & External Data**

- Connecting to CSV, databases, and online sources
- Data transformation (merge, append, unpivot, replace values)
- Automating repetitive cleaning steps
- Loading to Excel or Power BI for analysis

8. **Productivity & Efficiency**

- Keyboard shortcuts (navigation, formula editing, Pivot refresh.
- Named ranges & structured references (tables).
- Excel Tables for dynamic ranges.
- Advanced chart customization (secondary axis, combo charts).
- Automation with Power Query instead of macros .

- Complete project involving a comprehensive dashboard on a Crime Rate Bangladesh dataset in MS Excel & Insight discussion.
- Assignment

Module 04: Google Spreadsheet (Duration: 02 Hours)

1. **Quick Introduction**

- What is Google Sheets & when to use it instead of Excel?
- Creating a new spreadsheet (from Google Drive/template)
- Anatomy of a spreadsheet (rows, columns, menus - same as Excel)

2. **Collaboration & Sharing**

- Sharing spreadsheets with roles (viewer, editor, commenter)
- Real-time collaboration (multiple editors at once)
- Using comments, mentions, and notes
- Version history & restoring older versions
- Protecting sheets and ranges (fine-grained permissions)

3. **Google-Specific Functions & Features**

- IMPORTRANGE – pull data from another Google Sheet
- IMPORTXML / IMPORTHTML - pull data from websites
- ARRAYFORMULA - apply formulas to entire ranges
- FILTER / UNIQUE - dynamic analysis without PivotTables
- SPARKLINE - quick in-cell charts

4. **Visualization & Dashboarding**

- Creating charts
- Interactive dashboards with filter views
- Linking Sheets with Google Data Studio (Looker Studio) for business dashboards

5. **Integration & Automation**

- Connecting Google Sheets with Forms (automatic survey/response collection)
- Exporting/importing to Google Docs, Slides, and Drive
- Introduction to Google Apps Script (automating tasks, sending emails, API connections)

Module 05: Power BI (Duration: 14 hours)

- **Getting Started with Power BI**
  - Introduction
  - Introduction to Microsoft Power BI Desktop for Business Intelligence
  - Downloading Power BI & Configuration
  - Navigating the Power BI Desktop Interface & Workflow

- **Connecting & Shaping Data with Power BI Desktop**
  - Types of Data Connectors in Power BI Desktop
  - Power BI Query Editor (Power Query)
  - Demonstrating Basic Table Transformations in Power BI
  - Working with Text Tools in Power BI
  - Manipulating Numerical Values in Power BI
  - Handling Date & Time Data in Power BI
  - Creating a Rolling Calendar in Power BI Desktop
  - Generating Index & Conditional Columns in Power BI
  - Grouping & Aggregating Records in Power BI
  - Pivoting & Un-pivoting Data in Power BI
  - Merging Queries in Power BI Desktop

- Appending Queries in Power BI Desktop
- Appending Files from a Folder in Power BI Desktop
- Configuring Power BI Data Source Settings
- Configuring Power BI Query Refresh Settings
- Exploring Additional Data Types & Categories in Power BI
- Defining Hierarchies in Power BI Desktop
- Importing Models from Excel to Power BI
- Best Practices for Power BI Data Connection
- Homework: Connecting & Shaping Data with Power BI Desktop

❖ **Creating Table Relationships & Data Models in Power BI**
- What is a "Data Model" in Power BI?
- Principles of Database Normalization in Power BI
- Understanding Data Tables vs. Lookup Tables in Power BI
- Relationship Creation in Power BI Desktop
- Snowflake Schemas in Power BI
- Managing & Editing Table Relationships in Power BI Desktop
- Active vs. Inactive Relationships in Power BI Desktop
- Understanding Relationship Cardinality in Power BI
- Connecting Multiple Data Tables in Power BI Desktop
- Understanding Filter Flow in Power BI
- Two-Way Filters in Power BI (Use with Caution!)
- Hiding Fields from the Power BI Report View
- Exploring the New Power BI Desktop "Model" View
- Best Practices for Power BI Data Model
- Homework: Creating Table Relationships & Data Models in Power BI

❖ **Analyzing Data with DAX Calculations in Power BI**
- Introduction to Data Analysis Expressions (DAX) in Power BI
- Introduction to DAX Calculated Columns in Power BI
- Introduction to DAX Measures in Power BI
- Calculated Columns vs. DAX Measures in Power BI
- Adding Columns & DAX Measures in Power BI Desktop
- Implicit vs. Explicit DAX Measures in Power BI
- Examples of Filter Context in Power BI
- Step-by-Step DAX Measure Calculation in Power BI
- Understanding DAX Syntax & Operators in Power BI
- Common DAX Function Categories in Power BI
- Demonstrating Basic Date & Time Functions in Power BI
- Demonstrating Conditional & Logical Functions (IF/AND/OR) in Power BI
- Demonstrating Common Text Functions in Power BI
- Joining Data with RELATED in Power BI
- Basic Math & Stats Functions in Power BI
- COUNT Functions (COUNTA, DISTINCTCOUNT, COUNTROWS) in Power BI

- Paying Attention to Order Line Items in Power BI
- Using CALCULATE in Power BI
- CALCULATE & ALL in Power BI
- CALCULATE & FILTER in Power BI
- Iterator Functions (SUMX, RANKX) in Power BI
- Time Intelligence Formulas in Power BI
- Best Practices for DAX in Power BI
- Homework: Analyzing Data with DAX Calculations in Power BI

❖ **Visualizing Data with Power BI Reports**

- Exploring the "Report" View in Power BI Desktop
- Adding Simple Objects to the Power BI Report Canvas
- Inserting Basic Charts & Visuals in Power BI
- Conditional Formatting (Update)
- Report Formatting Options in Power BI
- Report Filtering Options in Power BI
- Exploring Data with Matrix Visuals in Power BI
- Filtering with Date Slicers in Power BI
- Showing Key Metrics with Cards & KPI Visuals in Power BI
- Inserting Text Cards in Power BI
- Visualizing Geospatial Data with Maps in Power BI
- Visualizing Data with Treemaps in Power BI
- Showing Trends with Line & Area Charts in Power BI
- Adding Trend Lines & Forecasts in Power BI
- Editing Power BI Report Interactions
- Adding Drillthrough Filters in Power BI
- Using Power BI Report Bookmarks
- Managing & Viewing Roles in Power BI Desktop
- Preview: Custom Power BI Visuals (Log-in Required)
- Preview: Designing for Phone vs. Desktop Report Viewers
- Preview: Publishing to Power BI Service
- Best Practices for Power BI Data Visualization

-Assignments: Visualizing Data with Power BI Reports

❖ **Artificial Intelligence (AI) Visuals**

- ➢ Q&A Visual in Power BI
- ➢ Key Influencers Visual in Power BI
- ➢ Understanding Correlation vs. Causation
- ➢ Decomposition Tree Visual in Power BI

❖ **Project (E-Commerce)**

Sales Analysis for an E-Commerce dataset in Power BI

- Two projects involving a comprehensive dashboard on a provided dataset in Power BI & Insight discussion.
- Assignment
-

Module 06: SQL (MySQL / PostgreSQL) (Duration: 8 hours)

1. **Environment Setup**

- Setting up a MySQL or PostgreSQL environment
- Installing client tools (pgAdmin, MySQL Workbench)
- Loading sample databases (employees, sales, e-commerce datasets)

2. **SQL Syntax Basics**

- SQL syntax rules (keywords, clauses, semicolons)
- Anatomy of a SQL query (SELECT → FROM → WHERE → GROUP BY → HAVING → ORDER BY)

3. **Data Retrieval**

- SELECT queries (columns, aliases for readability)
- DISTINCT for unique values
- WHERE conditions (AND, OR, NOT)
- Handling NULL values
- Sorting results with ORDER BY (ASC/DESC)

4. **Filtering & Aggregation**

- Mathematical & aggregate functions: COUNT, SUM, AVG, MIN, MAX
- GROUP BY for summarizing data
- HAVING for filtering aggregated results
- Comparison operators: LIKE, IN, BETWEEN

5. **Joins & Combining Data**

- INNER JOIN
- LEFT JOIN & RIGHT JOIN
- FULL JOIN
- SELF-JOIN
- UNION vs UNION ALL

6. **Data Modification (CRUD Operations)**

- INSERT INTO (adding records)

- UPDATE (modifying existing rows)
- DELETE (removing rows)
- Safe updates with WHERE conditions

7. **Schema & Table Management**

- CREATE TABLE (design basics, data types)
- ALTER TABLE (add/drop columns, constraints)
- TRUNCATE vs DROP (reset vs remove)

8. **Conditional Logic & Advanced Queries**

- CASE statements (if-else logic in SQL)
- Subqueries (in SELECT, FROM, WHERE)
- Common Table Expressions (CTEs) for readability
- Window functions (ROW_NUMBER, RANK, PARTITION BY)

- Complex Assignments
- Online SQL Certification Test

Module 07: Tableau (Duration: 7 hours)

1. **Getting Started with Tableau**

- Installation of Tableau (Desktop / Public)
- Connecting Tableau to a CSV or Excel file
- Navigating the Tableau interface
- Creating your first bar chart
- Adding colors, labels, and formatting for readability
- Exporting worksheets & sharing insights

2. **Working with Data & Time Series**

- Creating calculated fields (basic formulas)
- Handling time series data (date hierarchies, trends)
- Understanding aggregation & granularity (Sum vs Average, LOD basics)
- Creating area charts and highlights
- Adding filters & quick filters

3. **Building Visuals & Dashboards**

- Joins & relationships in Tableau (compare to SQL)

- Creating maps (geographical roles, hierarchies)
- Creating scatterplots (correlation analysis)
- Applying filters across multiple worksheets
- Creating your first dashboard
- Adding interactive actions: filters & highlights

4. **Combining Data & Advanced Visuals**

- Joining data (LEFT, RIGHT, INNER, OUTER joins)
- Handling duplicate values & joining on multiple fields
- Data blending vs joining (when sources differ)
- Understanding Tableau's data model & relationships
- Creating dual-axis charts (sales vs profit, comparisons)
- Advanced calculated fields (in blends, multiple sources)

5. **Advanced Dashboards & Storytelling**

- Table calculations (percent of total, rank, moving average)
- Creating bins & distributions (e.g., age groups, income brackets)
- Leveraging parameters for interactivity (dynamic filters, KPIs)
- Creating advanced charts: tree maps, customer segmentation
- Building an advanced dashboard (multiple KPIs, filters, visuals)
- Adding dashboard interactivity (parameter controls, highlight actions)
- Analyzing dashboard insights (business storytelling)
- Creating a storyline (sequence of dashboards → presentation)

- End-to-end live project involving a comprehensive dashboard on the **Customer Care Service dataset** using Tableau
- Assignment

Module 08: Exploratory Data Analysis with Python (7 Hours)

1. **Introduction to Exploratory Data Analysis**
   - Overview of EDA and its significance
   - Understanding the data exploration process
   - Exploring real-world applications of EDA

2. **Setting Up the Environment**
   - Installing and configuring essential Python libraries (Pandas, Matplotlib, Plotly & Seaborn)
   - Loading datasets from different sources (CSV, Excel, Google Sheets)

- Preliminary data inspection and understanding of data types

3. **Data Cleaning and Preprocessing**
   - Handling missing values: Imputation techniques and considerations
   - Dealing with duplicates and outliers
   - Data normalization, standardization, and scaling
   - Encoding categorical variables: One-hot encoding, label encoding

4. **Descriptive Statistics and Data Summarization**
   - Measures of central tendency, dispersion, and skewness
   - Understanding data distributions
   - Correlation analysis and heatmap visualization

5. **Data Visualization Techniques**
   - Univariate analysis: Histograms, box plots, and distribution plots
   - Bivariate analysis: Scatter plots, pair plots, and correlation plots
   - Multivariate analysis: Heatmaps, 3D plots, and parallel coordinates

6. **Case Studies and Practical Applications**
   - Applying EDA to real-world datasets (Selling prices, Customer churn)
   - Addressing specific challenges in data exploration
   - Interpreting results and making actionable insights

7. **Best Practices and Next Steps**
   - Documenting and reproducibility in EDA
   - Strategies for handling large and complex datasets
   - Recommendations for further learning and advanced topics

8. **Additional Resources:**
   - Recommended tutorials and books for further learning
   - Access to curated datasets for practice and exploration

- Final project involving a comprehensive EDA on a provided dataset using Python
- Assignment

Module 09: Project with Looker (Duration: 2.5 Hours)

Project: End-to-End Dashboard Creation using Looker

1. Real-time Data Scraping or Connecting to a data set from various Connectors in Looker Studio.

2. Auto-sync Data Schedule (Every 10 Minutes)
   - Implementing an Automated Data Synchronization Process for Regular Updates

3. Creating a Meaningful and Attractive Dashboard
- Designing a User-friendly Dashboard with Relevant Insights and Visualizations on a real-world dataset

- Final project involving real-world datasets **via Data scraping or connectors** in Google Looker Studio
- Assignment

Module 10: Job Interview & Freelancing Guidelines (02 Hours)

This module provides essential guidance on navigating job markets and freelance platforms to kickstart your career.

1. CV & Resume
- Crafting an Effective Curriculum Vitae (CV) and Resume for Job Applications and Freelance Proposals.

2. LinkedIn.com
- Understanding and Leveraging the Professional Networking Platform LinkedIn for Job Opportunities and Networking.

3. Upwork.com / Fiverr.com / Freelancer.com for Data Analytics.
- Navigating Popular Freelance Platforms for Finding Freelance Gigs, Showcasing Skills, and Attracting Clients. and Building a Portfolio.

Contact Details:

Sohan Khan

Course Coordinator, aiQuest Intelligence & Study Mart

Cell: +8801704265972 (Call/WhatsApp)

Facebook Community: Join Our Community!

Visit Our Pages: Study Mart, aiQuest Intelligence

Watch Free Courses: https://www.aiquest.org/free-courses