Module 1.1) DA- Introduction to DA/DS (Overview) [02]

➢ Difference Between Data Analysis, Data Science, AI, and Business Analysis (New):

* Understand the distinctions between these fields:

1. **Data Analysis:** Focused on extracting insights from data using statistical and analytical techniques.
2. **Data Science:** Incorporates data analysis, machine learning, and programming to solve complex problems.
3. **AI (Artificial Intelligence):** Involves the development of intelligent systems that can perform tasks typically requiring human intelligence.
4. **Business Analysis:** Focuses on identifying business needs and determining solutions to business problems through data analysis.

➢ **Steps of Data Analysis (New):**

Learn about the general steps involved in data analysis, which typically include:

1. **Data Collection:** Gathering relevant data from various sources.
2. **Data Cleaning:** Removing inconsistencies, errors, and outliers from the data.
3. **Data Exploration:** Exploring the data through visualizations and summary statistics to understand its characteristics.
4. **Data Preprocessing:** Transforming and preparing the data for analysis, including feature engineering and normalization.
5. **Data Analysis:** Applying statistical and analytical techniques to extract insights and patterns from the data.
6. **Interpretation and Communication:** Interpreting the results of the analysis and communicating findings to stakeholders effectively.

Module 1.2) DA - Introduction to Statistics [10]

➢ Introduction to Statistics:

Understand the fundamental concepts of statistics and its importance in data analysis.

➢ Random Variable:

- Types of Random Variables:
- Discrete Random Variable
- Continuous Random Variable
- Mean and Variance of Random Variable:

➢ Continuous Distribution:

- Uniform Distribution
- Normal Distribution
- Standard Normal Distribution
- Exponential Distribution
- Gamma Function
- Chi-square Distribution
- t Distribution
- F Distribution

➢ Discrete Distributions:

- Uniform Distribution
- Bernoulli Distribution
- Geometric Distribution
- Poisson Distribution

➢ Confidence Intervals, Sampling, and Statistical Inference:

➢ Hypothesis Testing

- Sample Size Calculator with Excel

Module 1.3) DA - Introduction to Business Excel [16]

➢ Excel Introduction:

- Understand the basics of Excel, including worksheets, cells, rows, columns, and formulas.

➢ Excel Functions:

- Learn about commonly used Excel functions such as VLOOKUP,
- XLOOKUP, HLOOKUP, MID, OFFSET, and CHOOSE, and their applications in data manipulation and analysis.

➢ Text Handling:

- Explore techniques for handling text data in Excel, including wrapping text, clearing formatting, and removing duplicates.

➢ Find and Replace:

- Understand how to use the Find and Replace feature to search for and replace specific content within an Excel workbook.

➢ Pivot Tables:

- Learn how to create and work with Pivot Tables for summarizing and analyzing large datasets efficiently.

➢ Calculate Frequency Distribution in Excel:

➢ Descriptive Statistics Using Excel:

➢ Correlation Matrix Using Excel:

➢ Introduction to Power Query:

- Understand the basics of Power Query, including installing the Power
- Query Add-in, overview of the Query Editor, and importing data from various sources.

➢ Importing Data:

- Learn how to import data from web sources, text files, CSV files, and external Excel workbooks using Power Query.

➢ Data Manipulation:

- Explore advanced data manipulation techniques in Power Query, including appending Excel tables, merging tables or queries, combining files from folders, and getting a list of file names from a folder.

➢ PQ Functions and M Language:

- Understand the useful text functions available in Power Query, creating IF, OR, and IF AND functions, overview of the M language, inserting comments in M code, and converting queries to functions.

➢ VBA (Visual Basic for Applications)

- Introduction to VBA and its role in automating Excel tasks.
- Writing and executing VBA macros to perform customized actions in Excel.

➢ Macros

- Understanding macros and their significance in Excel automation.
- Recording and editing macros to streamline repetitive tasks in Excel.

➢ Building Excel Dashboards:

- Learn how to create interactive and visually appealing dashboards in Excel using Pivot Tables, Pivot Charts, slicers, and other features.

Module 1.4) DA - Introduction to SQL [12]

➢ Introduction to SQL:

- Understand what SQL is, why it's used, and its syntax for querying and

managing databases.

➢ SQL Basic Data Types:

- Learn about different data types in SQL, including string, numeric, date, and time data types.

➢ SQL Operators:

- Explore SQL operators, including arithmetic, multiplication, division, modulus, logical, and set operators.

➢ SELECT Statement:

- Understand the SELECT statement and its variations, including SELECT with WHERE, GROUP BY, and HAVING clauses.

➢ Aggregation Functions:

- Learn about aggregation functions in SQL, including COUNT, SUM, and DISTINCT, for summarizing data.

➢ LIMIT Clause:

- Understand how to use the LIMIT clause in MySQL to restrict the number of rows returned by a query.

➢ SELECT AS:

- Learn how to use the AS keyword to alias column names or expressions in SQL queries.

➢ Joins:

- Explore different types of SQL joins, including INNER JOIN, OUTER JOIN, LEFT JOIN, and FULL JOIN, for combining data from multiple tables.

➢ ORDER BY Clause:

- Understand how to use the ORDER BY clause to sort query results based on one or more columns.

➢ Advanced SQL Queries:

- Dive into advanced SQL query techniques, such as selecting data from multiple tables, working with dates, handling NULL values, and using logical operators like AND and OR.

➢ Stored Procedures and Views:

- Creating and managing stored procedures and views in a database.

➢ Triggers:

- Implementing triggers to automate database actions.

➢ Normalization:

- Applying normalization techniques to eliminate data redundancy and improve database efficiency.

➢ Importing/Exporting Data from Excel:

- Exporting database data to Excel for analysis and reporting purposes.

➢ Entity-Relationship (ER) Modelling:

- Understanding ER modelling principles for designing database schemas.

Module 1.5) DA - Creating Dashboard with Visualization Tool

➢ Introduction to Power BI:

- Understand what Power BI is, its capabilities, and why it's used for data visualization and business intelligence.

➢ Power BI Installation and Set Up:

- Learn how to install and set up Power BI on your computer.

➢ Understanding Power BI Dashboard:

- Explore the components of a Power BI dashboard and how they work together to visualize data.

➢ Power Query (ETL Tool):

- Understand the role of Power Query in data transformation and learn how to use the Query Editor to clean and shape data.

➢ Power Pivot Table:

- Learn how to use Power Pivot tables to create relationships between tables and perform advanced data analysis.

➢ Power View (Visualization Charts):

- Explore Power View to create interactive and visually appealing charts and visualizations.

➢ Power BI Services:

- Understand how Power BI Services complement the desktop application for sharing and collaborating on reports and dashboards.

➢ Data Connection Types in Power BI:

- Learn about the various types of data connections available in Power BI, including importing data from different sources.

➢ Data Analysis Expressions (DAX):

- Learn the basics of DAX and explore examples of DAX functions for data analysis and calculations.

➢ Format Tools for Charts and Visualization:

- Understand the formatting options available in Power BI for customizing charts and visualizations.
- Create Tables in Power BI:
- Learn how to create tables and manage data within Power BI.

➢ Text Functions and IF Functions:

- Explore useful text functions and learn how to create IF, OR, and IF AND functions in Power BI.

➢ M Language Overview:

- Understand the basics of M language and its role in data transformation and manipulation.

➢ Creating Maps in Power BI:

- Learn how to create maps and change backgrounds in Power BI to visualize geographic data.

➢ Subtotals, Totals, Cards, Filters, and Slicers:

- Explore features like subtotals, totals, cards, filters, and slicers for enhancing data analysis and visualization.

➢ Creating Dashboards:

- Learn how to create and customize dashboards in Power BI to present data insights effectively