

# Syllabus

Training includes project files, quizzes and homework exercises, on instructor support.



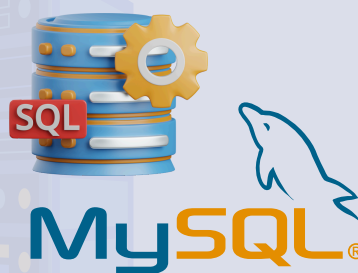
## Module 1 - Introduction to AI / Data Science.

- 1- What is data?, What is data science?
- 2- Intro to Data Science Career and Road Map
- 3- Data analysis vs data science?
- 4- Learn about the Competencies for Data Sciences.
- 5- Data Scientist skills.
- 6- Intro to Programming, Python, Databases, Machine Learning and AI .



## Module 2 - SQL Databases.

- 1- Understanding Databases Concepts & Relational
- 2- Introduction to Database Management [RDBMS]
- 3- Creating Database & Relationships in RDBMS.
- 4- SQL Basics (Read, filter, aggregation)
- 5- SQL Operations (grouping, joins, subqueries)
- 6- Define database objects in schemas
- 7- Advanced SQL (window functions, insert data, MS SQL Server)
- 8- Configure the SELECT statement.
- 9- SQL Projects
- 10- Work with data types, Handling NULL cases, subqueries, views and procedures



## Module 3 - Statistics & Linear Algebra.

1. Learn the important topics in statistics for Data Science& Data Analysis.
2. Understanding the Concept of
  - i. Central Tendency (Mode, Median and Mean)
  - ii. Dispersion (Variance and Standard deviation)
  - iii. Descriptive statistics
  - iv. Distribution of data
  - v. Population vs. Samples
  - vi. Correlation
  - vii. Linear Algebra.



$$\sigma^2 = \frac{\sum (x_i - \mu)^2}{n}$$



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## Module 4 - Python Programming

- **Python Introduction & data types**

1- Learn Python basics for Data Analysis.

- Operators, Data Types and Variables.
- Reading Input, Print, Formatted printing.
- Lists, Slicing, Built-In Functions Used on Lists.
- Ranges, Tuples, Basic Tuple Operations, Built-In Functions Used on Tuples, Dictionaries, Built-In Functions Used on Dictionaries, Sets.
- Python Conditionals, if-condition, While Loops, For Loops.
- List, Dictionary and Set comprehensions, Function, types of function.
- Python Modules & Libraries.
- Classes and objects in Python (OOP)

- **Working with Anaconda and Jupyter Notebook.**

- **Web Scraping.**

Using Python for web Scraping to multiple Websites.



## Module 5 - Pandas and Machine Learning

- Introduction to Pandas & NumPy Arrays.
- DataFrames Introduction, dealing with dataframes, slicing and retrieving data from dataframe objects.
- Read data using Pandas from CSV files, Excel, or SQL.
- Store data in files.
- Statistical analysis on data using Pandas and detecting problems in the data.
- Data cleaning and manipulation
- Data preprocessing and feature engineering
- Data visualization using Seaborn, understand different types of plots and graphs.
- Data analysis using visualization.
- Machine Learning introduction: basic modelling and data science projects



## Final Project.

