

Data Analytics (SQL) BOOTCAMP

Goal: Teach students how data can be collected, organized, queried, analyzed, and used for decision-making, with an introduction to AI/ML concepts. This reflects the official description of the bootcamp.

Module 1: Introduction to Data

- What is data?
- Data vs information
- Structured and unstructured data
- Examples of data in everyday life
- What is data analytics?
- Why businesses use data

Activity: Identify data around us.

Module 2: Understanding Databases

- What is a database?
- Tables, rows and columns
- Records and fields
- Primary keys
- Relationships between data
- Introduction to relational databases

Activity: Design a simple student database.

Module 3: Introduction to SQL

- What is SQL?
- SQL databases
- SELECT
- FROM
- Basic queries
- Selecting specific columns

Practice: Query a student database.

Module 4: Filtering & Sorting Data

- WHERE
- Comparison operators
- AND / OR
- IN
- BETWEEN
- LIKE
- ORDER BY
- LIMIT

Project: Search and filter a school dataset.

Module 5: Calculations & Aggregation

- COUNT
- SUM
- AVG
- MIN
- MAX
- GROUP BY
- HAVING

Project: Analyze student marks or sales data.

Module 6: Combining Data

- Primary and foreign keys
- Relationships
- INNER JOIN
- LEFT JOIN
- Understanding multiple tables

Activity: Combine student, class and marks tables.

Module 7: Data Cleaning

- Missing data
- Duplicate records
- Incorrect values
- Standardizing data
- NULL values
- Data quality

Project: Clean a small dataset.

Module 8: Data Analysis & Visualization

- Finding patterns
- Comparing groups
- Trends
- Basic statistics
- Charts and graphs
- Choosing the appropriate visualization

Project: Create a simple data dashboard/report.

Module 9: AI/ML Concepts for Beginners

- What is Artificial Intelligence?
- What is Machine Learning?
- Training data
- Features and labels
- Prediction
- Classification
- Why data quality matters for AI

Activity: Build a simple conceptual prediction model.

Module 10: Data Analytics Capstone

Students analyze a real-world dataset such as:

- Student performance
- Sports statistics
- Sales
- Weather
- Movies
- School attendance

Students will:

1. Understand the dataset
2. Clean the data
3. Write SQL queries
4. Find patterns
5. Create visualizations
6. Present conclusions

Final Outcome: Students learn how to turn raw data into useful information and decisions.