COURSE SYLLABUS

# SQL Bootcamp (PostgreSQL)

In this hands-on course, you'll learn PostgreSQL and the free DBeaver app to explore the database and execute SQL queries you write. The concepts you'll learn on PostgreSQL can be applied to other flavors of SQL (such as Microsoft SQL Server, MySQL, etc.) with minor syntax differences.

> Group classes (NYC) and onsite training are available for this course. For more information, email corporate@nobledesktop.com or visit: https://training-nyc.com/courses/postgresql-bootcamp



nyc@careercenters.com • (212) 658-1918

# Course Outline

## Foundations of SQL & Databases

### SQL Fundamental Concepts

- What is SQL & why is it used?
- Flavors of SQL: Postgres vs SQL Server, etc.
- Database Tables, Rows, & Columns
- Using ER (Entity Relationship) Diagrams to visualize what's in a database

### Exploring Databases & Writing SQL Statements (using the free DBeaver app)

- Connecting to a Database
- Database Navigator
- SQL Query Editor
- Using Code Hints
- Viewing the Results of your SQL query
- Setting Preferences

## Writing SQL Queries

### Writing SELECT Statements

- Syntax of a SELECT statement
- Selecting all columns or specific columns from a table
- Limiting the number of results using LIMIT
- Ordering the results using ORDER BY
- Returning only DISTINCT records (eliminating duplicates)

### Filtering Results

- Data Types (Strings vs Numbers)
- Comparison Operators: equal to, greater or less than, not equal to, etc.
- Filtering results using WHERE, AND, OR, IN, and NOT
- Pattern Matching: Wildcard Filters
- Case Sensitivity

## Using Joins to Combine Data from Multiple Tables

### Understanding Table Relationships

- What are Primary vs Foreign Keys
- Database Relations: One-to-One, One-to-Many, & Many-to-Many

### Inner Joins

- The difference between Inner & Outer Joins
- Inner Joins
- Column & Table Aliases

### Outer Joins & Finding NULLs

- Left Join
- Right Join
- Full Join
- Find NULL values

## Manipulating, Aggregating, & Filtering Data

### Using CAST to Change Data Types

Why and how to use CAST to make a data type fit your query's needs

### Aggregate Functions

- Using Aggregate Functions to perform common statistical calculations
- Using SUM, COUNT, AVG, MAX & MIN

### Working with Dates & Time

- Date Functions: Getting the desired part of a date/time (Year, Month, Day, etc.)
- Formatting dates, including the day of the week (Sunday, Monday, etc.)
- Calculating the difference between 2 dates

## Grouping Data & Filtering Grouped Data

### Grouping Data with Aggregate Functions

- Using GROUP BY to organize results into categories
- Applying Aggregate Functions to groups

### Filtering Grouped Data with HAVING

- Using HAVING to filter the results of a GROUP BY
- HAVING vs WHERE

## Advanced Query Techniques

### Subqueries

- Subqueries: Queries within queries
- Single-Value vs Multi-Value vs Table-Value Subqueries

### Aggregate Window Functions

Using OVER and PARTITION BY to apply Aggregate Functions

### Conditionals with CASE

- Adding If-Else Logic with CASE
- Simple CASE vs Searched CASE

### String Functions

- Manipulating text using string functions
- Using SUBSTRING, SPLIT_PART, UPPER, etc.

### Self Join

- How a Self Join is different from other types of joins
- Using a Self Join

## Views & User-Defined Functions

### Views

- What are Views?
- The Advantages & Disadvantages of using Views
- How to Use & Query a View

### Materialized Views

The difference between regular Views and Materialized Views

### User-Defined Functions

- Using Scalar-Value (Single-Value) Functions
- Using Table-Value Functions