### 4-Week Introduction to Data Analytics Course Outline

#### **Week 1: Introduction to Data and Database Management**

##### *Day 1-2: Understanding Data*

* **Introduction to Data:** Types, Importance, and Applications
* **Data Sources:** Structured vs. Unstructured Data
* **Case Studies:** Real-world Applications of Data Analytics

##### *Day 3-5: Basics of Database Management*

* **Introduction to Databases:** Types and Uses
* **Database Management Systems (DBMS):** Overview and Functions
* **SQL Basics:** Creating, Reading, Updating, and Deleting Data (CRUD Operations)
* **Hands-on:** Creating a Simple Database using SQL

#### **Week 2: Advanced SQL and Database Design**

##### *Day 1-2: Advanced SQL Techniques*

* **Joins, Subqueries, and Nested Queries**
* **Aggregation Functions and Grouping Data**
* **Data Filtering and Sorting Techniques**

##### *Day 3-5: Database Design and Normalization*

* **Understanding Data Models and Relationships**
* **Database Normalization:** Purpose and Techniques
* **Hands-on:** Designing a Normalized Database Schema
* **Assignment:** Design a Database for a Given Scenario

#### **Week 3: Introduction to Python and Data Access Layer**

##### *Day 1-2: Getting Started with Python*

* **Introduction to Python:** Syntax and Data Types
* **Control Structures:** Loops and Conditionals
* **Functions and Modules in Python**

##### *Day 3-5: Building a Data Access Layer*

* **Connecting Python to SQL using Libraries** (e.g., SQLite, SQLAlchemy)
* **CRUD Operations using Python**
* **Error Handling and Data Validation**
* **Hands-on:** Developing a Data Access Layer using Python and SQL

#### **Week 4: Data Analysis using Python**

##### *Day 1-2: Introduction to Data Analysis*

* **Overview of Data Analysis Process**
* **Introduction to Data Analysis Libraries in Python** (e.g., Pandas, NumPy)
* **Data Cleaning and Preprocessing Techniques**

##### *Day 3-4: Exploratory Data Analysis (EDA)*

* **Descriptive Statistics and Data Visualization**
* **Handling Missing Data and Outliers**
* **Hands-on:** Performing EDA on a Sample Dataset

##### *Day 5: Final Project and Course Wrap-up*

* **Final Project:** Building a Simple Data Analytics Application
* **Project Presentations and Peer Review**
* **Course Recap and Feedback Session**

### Additional Notes:

* **Assessment:**
  + **Weekly Quizzes:** To assess the understanding of the weekly topics.
  + **Assignments:** Practical assignments to apply learned concepts.
  + **Final Project:** A comprehensive project encompassing all learned concepts.
* **Practical Sessions:**
  + Include lab sessions for hands-on practice on SQL and Python.
  + Use real-world datasets for practical assignments and projects.
* **Guest Lectures:**
  + Invite industry experts for guest lectures to provide insights into real-world data analytics applications.
* **Resources:**
  + Provide students with learning resources like e-books, tutorials, and documentation for further learning.
* **Support:**
  + Conduct doubt-clearing sessions and provide additional support for project work.

### Technology Stack:

* **Database:** SQLite, MySQL, or PostgreSQL
* **Programming Language:** Python
* **Libraries:** Pandas, NumPy, SQLAlchemy, Matplotlib/Seaborn
* **Tools:** Jupyter Notebooks, DB Browser for SQLite, or any SQL IDE
* **Platform:** Google Classroom or any Learning Management System (LMS) for sharing resources and assignments.

### Prerequisites:

* Basic computer literacy.
* Fundamental knowledge of mathematics and logical reasoning.

Feel free to adjust the course outline as per the specific needs and pace of the students. This structured approach ensures a balanced blend of theoretical knowledge and practical skills in data analytics for 10th-grade students.