



SCHOOL OF DATA SCIENCE



Business Analytics with Tableau

Syllabus

UDACITY.COM

Overview

Master essential data analysis skills to drive informed business decisions across industries. This program covers data fundamentals, teaching you to collect, analyze, and visualize data using Excel, SQL, and Tableau. Learn to work with spreadsheets, perform basic statistical analysis, create financial reports, and build interactive dashboards. Apply your skills to real-world projects, such as analyzing profits for an e-commerce company and optimizing business practices using a retail transaction database. Gain proficiency in data-driven decision-making and create impactful visualizations. This program is designed for aspiring business analysts and professionals seeking to enhance their data analysis and interpretation capabilities in a business context.

Nanodegree Program **Beginner** **40 hours** **4.8** (1247 Reviews)

Prerequisites

No required prerequisites.

You will also need to be able to communicate fluently and professionally in **written and spoken English**.

Skills You'll Learn

Business Metrics with Spreadsheets

Scatter Plot Awareness | Growth metrics | Spreadsheet Navigation | Data visualization in spreadsheets | KPI Awareness | Lookups and Pivoting | Finance metrics | Line and Area Charts in Spreadsheets | Basic spreadsheet use | Tabular Data Awareness | Spreadsheet Operations | Efficiency Metrics | Pie Charts in Spreadsheets | Spreadsheet Cell Referencing | Scatter Plots in Spreadsheets | Pie Chart Awareness | Business metrics | Customer Satisfaction Metrics | Bar and Column Charts in Spreadsheets | Function and Formula Syntax | Histograms in Spreadsheets | Bar and Column Chart Awareness | Spreadsheet functions | Data types | Histogram Awareness | Profitability Metrics | Date and Data Cleanup | Basic descriptive statistics | Line and Area Chart Awareness | Chart types | Data Relationships | Chart Selection and Formatting in Spreadsheets | Innovation Metrics | Pivot tables | Data Summarization | Logic and Aggregation Formulas

SQL for Data Analysis

SQL joins | SQL Clauses | SQL subqueries | SQL Operators | SQL Clauses | SQL Data Cleaning | SQL aggregations | Basic SQL

Data Visualization in Tableau

Univariate and Bivariate Chart Selection | Tableau Aggregations | Tableau visualizations | Tableau proficiency | Tableau Marks and Filters | Data Visualization Design Integrity | Interactive and Responsive Tableau Dashboard Design | Tableau hierarchies | Tableau Dashboard Creation | Connecting to Data and Setting Up Tableau | Tableau interactive dashboards | Tableau Chart Types | Tableau storypoint | Color and Visual Encodings | Tableau groups | Building and Saving Worksheets in Tableau | Tableau calculated fields

Courses

01. Business Metrics with Spreadsheets

11 hours

Start with the basics and build up to powerful spreadsheet skills in this hands-on course. You'll begin by exploring types of data, measures of center and spread, and how to interpret descriptive statistics. Then you'll learn how businesses use KPIs and metrics to track performance before diving into spreadsheets to analyze, clean, and visualize data. From formulas and functions to pivot tables and professional charts, you'll develop the skills to turn raw numbers into insights. In the final project, you'll apply what you've learned to analyze profits for an e-commerce company.

L1	Introduction to Data Overview	Discover what data is, where it shows up in everyday life, and why understanding it can help you make smarter decisions across any industry.
L2	What Is Data	Interpret tabular data by identifying what's being measured, understanding how it's organized, and recognizing the role of metadata in adding context.
L3	Data Types	Distinguish between different data types—like numerical vs. categorical—and apply the right reasoning based on how the data is structured and measured.
L4	Data Summarization	Summarize datasets using frequencies, measures of center and spread, and descriptive statistics like five-number summaries and tables.
L5	Data Relationships	Explore how values relate using ratios, proportions, and correlations to compare parts and measure connections between variables.
L6	Introduction to Data Review	Wrap up your introduction to data by reviewing key takeaways about structure, types, summaries, and relationships—building confidence for your next steps in analysis.
L7	Business Metrics Overview	Get introduced to five major categories of business metrics and explore how companies measure progress toward common goals like growth, efficiency, and innovation.
L8	Key Performance Indicators (KPIs)	Discover how KPIs track business goals and support strategic decisions through clear, measurable indicators across different departments.
L9	Growth Metrics	Explore common growth metrics like revenue growth rate, market share, and active users—and learn how to calculate, interpret, and apply them to track business expansion.
L10	Efficiency Metrics	Explore how time, cost, and resource-based metrics help evaluate and improve a company's operational efficiency.

L11	Profitability Metrics	Understand how gross margin, net earnings, EBITDA, and CLV reveal how well a business turns revenue into profit.
L12	Customer Satisfaction Metrics	Evaluate customer happiness and loyalty using metrics like CSAT, churn rate, and repeat purchase rate.
L13	Innovation Metrics	Track how a business develops and adopts new ideas using metrics like product output, adoption rates, and R&D investment.
L14	Financial Statements	Learn how to read and interpret the income statement, cash flow statement, and balance sheet to assess a company's profitability, liquidity, and overall financial health.
L15	Business Metrics Review	Wrap up your understanding of business metrics with a recap of KPI categories, goal types, and the financial statements that help companies track performance across the board.
L16	Introduction to Spreadsheets Overview	Get introduced to the history and power of spreadsheets, explore their core features, and see why they're essential tools for data analysis—no matter which application you choose to use.
L17	Spreadsheet Navigation	Get comfortable navigating spreadsheet interfaces, using menus, toolbars, and shortcuts to organize data and perform key operations efficiently.
L18	Locating and Identifying Data in Spreadsheets	Master the use of cell references in spreadsheets, including relative vs. absolute references and named ranges, to write clearer formulas and manage data across sheets.
L19	Spreadsheet Operations	Perform essential spreadsheet operations like sorting, filtering, copying, and deleting to keep your data clean, organized, and ready for analysis or presentation.
L20	Introduction to Spreadsheets Review	Wrap up your introduction to spreadsheets by reinforcing key concepts like cells, rows, and columns—plus gain confidence in building, editing, and saving your own spreadsheets.
L21	Spreadsheet Data Analysis Overview	Get oriented to the process of analyzing data in spreadsheets, from cleaning messy inputs to asking meaningful questions that turn raw information into actionable insight.
L22	Math and Text in Spreadsheets	Build and troubleshoot formulas that calculate values, manipulate text, and combine cell references to clean and analyze spreadsheet data.
L23	Logic and Aggregation in Spreadsheets	Apply logic and condition-based calculations using functions like IF, AND, and COUNTIFS to filter, aggregate, and clean spreadsheet data based on custom rules.
L24	Dates, Validation, and Worksheet Operations in Spreadsheets	Work with dates and clean tabular data using spreadsheet tools for extraction, validation, deduplication, and text splitting to prepare datasets for analysis.

L25	Reference and Summarization in Spreadsheets	Retrieve reference data and summarize large datasets using lookup functions and pivot tables for efficient spreadsheet analysis.
L26	Spreadsheet Data Analysis Review	Wrap up your journey through spreadsheet data analysis by reviewing key techniques for cleaning, transforming, and querying data—all in service of answering real-world questions.
L27	Spreadsheet Data Visualization Overview	Explore how charts can bring your data to life. This overview sets the stage for creating pie charts, bar charts, line graphs, and more—so you can spot trends and communicate clearly.
L28	Introduction to Pie Charts	Understand when pie charts work best for showing part-to-whole comparisons and recognize common pitfalls that make them less effective.
L29	Pie Charts in Spreadsheets	Create and format pie charts in spreadsheets to highlight how categories contribute to a whole, adjusting labels, formatting, and layout for clear and accurate presentation.
L30	Introduction to Bar and Column Charts	Interpret and choose between bar and column charts to compare categorical data, understanding when to use grouped or stacked formats to highlight relationships and category differences.
L31	Bar and Column Charts in Spreadsheets	Create and customize bar and column charts in spreadsheets to compare categories, format axes and labels for clarity, and display grouped or stacked layouts for multi-dimensional data.
L32	Introduction to Line and Area Charts	Understand how line and area charts reveal trends over time, compare categories, and represent parts of a whole, while recognizing when these chart types are appropriate or potentially misleading.
L33	Line and Area Charts in Spreadsheets	Create and customize line and area charts in spreadsheets to visualize trends, compare series, and highlight data patterns with clear formatting and multiple data series.
L34	Introduction to Scatter Plots	Interpret scatter plots to explore relationships between two numerical variables, assess correlation strength and direction, and spot clusters, trends, or outliers.
L35	Scatter Plots in Spreadsheets	Create and customize scatter plots in spreadsheets to reveal patterns, spot outliers, and explore potential correlations between two numerical variables.
L36	Introduction to Histograms	Learn how values are distributed across ranges, estimate variability, and spot outliers using histograms to interpret the shape and spread of numerical data.
L37	Histograms in Spreadsheets	Create and customize histogram charts in spreadsheets to visualize how numerical data is distributed, spot frequency patterns, and identify variability or outliers.

L38	Choosing Appropriate Spreadsheet Visualizations	Choose the right chart type for your data and refine its design to clearly communicate trends, comparisons, and distributions to your audience.
L39	Spreadsheet Data Visualization Review	Wrap up your charting journey by reinforcing key takeaways—from choosing the right chart type to formatting it for clarity and impact—all using spreadsheet tools.
L40	Project: Analyze Profits for E-commerce Company	Analyze real ecommerce financial data, build key business metrics in spreadsheets, and create a presentation to showcase solutions for increasing company profits.

02. SQL for Data Analysis

19 hours

SQL is one of the most versatile tools available when it comes to extracting insights from stored data. Learn how to execute core SQL commands to define, select, manipulate, control access, aggregate, and join data and data tables. Understand when and how to use subqueries, several window functions, and partitions to complete complex tasks. Clean data, optimize SQL queries, and write select advanced JOINS to enhance analysis performance. Explain which cases you would want to use particular SQL commands and apply the results from queries to address business problems.

L1	SQL Operators Introduction	An Introduction to the course and using the Parch & Posey sales database to solve real-world business questions.
L2	Introduction to SQL	Explore SQL basics, its importance for data analysis, business use cases, database structure, and an overview of popular SQL databases with hands-on practice.
L3	Entity Relationship Diagrams	Learn how to interpret Entity Relationship Diagrams (ERDs) to visualize tables, columns, and relationships in a relational database.
L4	An Introduction to Statements in SQL	Learn SQL basics by understanding key statements like SELECT and FROM, practicing queries, and following best practices for formatting and execution in a SQL workspace environment.
L5	The LIMIT Clause in SQL	Learn how to use the LIMIT clause in SQL to restrict the number of rows returned in query results, making data exploration faster and more manageable.
L6	ORDER BY Clause in SQL	Learn to use the SQL ORDER BY clause to sort query results by one or multiple columns, in ascending or descending order, with practical query exercises and solutions.
L7	WHERE Clause in SQL	Learn to use the SQL WHERE clause to filter table data based on numeric or text conditions, using operators like =, !=, >, <, and practice with real-world queries.



L8	Arithmetic Operators in SQL	Learn how to use arithmetic operators in SQL to create derived columns, perform calculations in queries, and apply order of operations for accurate results.
L9	LIKE and IN Operators in SQL	Learn how to use SQL's LIKE and IN operators to filter text and numeric data efficiently, enabling flexible database queries with wildcards and value lists.
L10	NOT and OR Operators in SQL	Learn how to use SQL's NOT and OR operators to filter data, combine conditions, and query for records that do not or do match given criteria, with practical examples and exercises.
L11	AND and BETWEEN Operators in SQL	Learn to use AND and BETWEEN operators in SQL to filter data with multiple conditions and ranges, practicing queries on real tables and understanding inclusivity of endpoints.
L12	SQL Operators Recap	Review key SQL commands, syntax, and concepts such as SELECT, FROM, WHERE, ORDER BY, LIKE, and data structure. Reinforce skills to write and understand basic SQL queries.
L13	JOIN Introduction	Gain an understanding of the definition of JOINS and database normalization and learn why they are needed.
L14	Introduction to Inner JOINS in SQL	Learn how to use INNER JOINS in SQL to combine data from multiple tables, write JOIN queries, and specify columns from different tables using the ON clause.
L15	JOINS in SQL	Learn how to use INNER, LEFT, and RIGHT JOINS in SQL to combine data from multiple tables, including filtering joins and understanding NULLs in join results.
L16	Advanced JOIN Concepts	Explore advanced SQL JOINS, primary and foreign keys, multi-table joins, and aliases to efficiently combine and analyze relational database tables.
L17	JOIN Recap	Recap key concepts learned in this lesson.
L18	SQL Aggregation Introduction	An overview of the content that will be learned in Lesson 3.
L19	NULLs and Aggregation	Learn how NULLs represent missing data in SQL, how they differ from zeros, and how to identify or exclude them using IS NULL or IS NOT NULL in queries and aggregations.
L20	COUNT in SQL	Learn how to use SQL's COUNT function to count rows, understand the difference between COUNT(*) and COUNT(column), and see how NULL values affect results.
L21	SUM in SQL	Learn how to use the SQL SUM function to total numeric columns, handle NULL values, and perform aggregations across data for inventory analysis and sales calculations.

L22	MIN, MAX, and AVG in SQL	Learn to use SQL's MIN, MAX, and AVG aggregate functions to find minimums, maximums, and averages, while understanding their handling of NULLs and practical business applications.
L23	GROUP BY in SQL	Learn how to use GROUP BY in SQL to aggregate data within subsets, group by multiple columns, and combine GROUP BY with ORDER BY for insightful data analysis.
L24	DISTINCT in SQL	Learn how to use DISTINCT in SQL SELECT statements to retrieve unique rows across specified columns, with practical examples and exercises for real-world query scenarios.
L25	HAVING Clause in SQL	Learn how to use the SQL HAVING clause to filter aggregated group results, enabling analysis of grouped data with aggregate functions beyond the WHERE clause.
L26	DATE in SQL	Explore how to use SQL date functions like DATE_TRUNC and DATE_PART to analyze, aggregate, and group data by various date parts for effective reporting.
L27	CASE Statements in SQL	Learn to use SQL CASE statements for conditional logic in SELECT queries, including multi-case logic, handling NULLs, and combining CASE with aggregations.
L28	Introduction to Subqueries	Learn the basics of SQL subqueries, focusing on scalar subqueries, to simplify complex logic and compare values efficiently within a single query.
L29	Subqueries in the WHERE Clause	Learn how to use subqueries in the WHERE clause to filter SQL results dynamically, making queries more flexible and readable. Practice building both scalar and filtering subqueries.
L30	Subqueries in the FROM Clause	Learn how to use subqueries in the FROM clause to create derived tables, transform data, and build complex SQL queries efficiently with practical examples.
L31	Common Table Expressions (CTEs)	Learn how Common Table Expressions (CTEs) make complex SQL queries cleaner, more readable, and efficient by organizing logic into reusable, easily-managed parts with the WITH clause.
L32	Temporary Tables in SQL	Discover how temporary tables in SQL simplify complex queries by storing intermediate results, boosting performance, organizing logic, and supporting efficient data analysis.
L33	Tips for Clean and Efficient SQL	Learn key tips for writing clean, efficient SQL using subqueries, CTEs, and temp tables, plus best practices for clarity, performance, and maintainability.
L34	SQL Window Functions	Discover SQL window functions to perform calculations like totals, averages, and ranking across rows while retaining individual data for advanced analysis.

L35	Working with SQL PARTITION BY	Discover how SQL's PARTITION BY enables advanced analytics—like running totals, rankings, and trend analysis—across groups without losing row-level detail.
L36	Order in Window Functions	Understand the role of ORDER BY in SQL window functions for ordering, ranking, and framing data, including ROWS vs RANGE and practical uses like running totals and moving averages.
L37	Building a Window Function	Learn how to build SQL window functions for detailed analysis, cumulative totals, and efficient queries using PARTITION BY, ORDER BY, and smart optimization strategies.
L38	SQL Data Cleaning Introduction	Learn why data cleaning is crucial, how to identify issues like duplicates, nulls, and outliers, and practical SQL techniques to ensure analysis is accurate and reliable.
L39	SQL Data Cleaning	Learn essential SQL data cleaning skills: handle missing values, remove duplicates, standardize text, and fix data types for accurate, reliable analysis.
L40	Advanced SQL Data Cleaning	Learn advanced SQL data cleaning using staging tables and workflows for scalable, reliable data prep, with best practices for consistency, deduplication, and quality control.
L41	Project: Retail Analysis	Use your newfound SQL prowess to answer the questions in the document, create a data dictionary, and an ERD (Entity Relationship Diagram).

03. Data Visualization in Tableau

10 hours

Learn how to build engaging and interactive Tableau dashboards to answer business questions. Start with an overview of data visualization best practices, including visual encodings, chart junk, and accessibility. Then dive into Tableau, from connecting to your first data source to creating interactive visualizations. Manipulate data and plots using hierarchies, dual axes, and calculated fields. Tell compelling stories using Tableau dashboards and story points. In the final project, you will build Tableau visualizations to answer key questions about a selection of datasets.

L1	Design Principles for Effective Data Visualizations Overview	Get introduced to the core ideas behind effective data visualization, including design principles, common chart types, and how visuals support storytelling with data.
L2	Plot Types and When to Use Them	Learn how to choose the right visualizations for exploring data or communicating insights, from histograms to time series to side-by-side bar charts.
L3	Data Visualization Design Integrity	Apply design principles to make your data visualizations clear, effective, and trustworthy.



L4	Using Color and Additional Encodings	Use color, shape, and size to highlight patterns, emphasize insights, and support accessible data communication.
L5	Design Principles for Effective Data Visualizations Review	Review the key ideas behind effective data visualizations and reflect on how principles like chart selection and clarity support strong data storytelling.
L6	Getting Started with Tableau	Get started with Tableau by installing the software, connecting to datasets, and preparing your workspace for analysis.
L7	Getting Started with Tableau Visualizations	Learn how to build and save your first Tableau visualizations using dimensions, measures, and calculated fields.
L8	Getting Started with Tableau Review	Recap how Tableau organizes data and visualizations, including key components like rows, columns, and calculated fields, as you reflect on your first experience using the tool.
L9	Working with Core Chart Types Overview	Get a preview of essential Tableau features—like marks, filters, and chart types—that will support deeper exploration and more advanced visualizations.
L10	Aggregations and Granularity in Tableau	Learn how to control aggregation and granularity in Tableau to create more insightful visualizations.
L11	Using Hierarchies for Drill-Down Analysis	Build interactive visualizations by drilling into custom and automatic hierarchies in Tableau.
L12	Customizing Marks and Filters for Insightful Visuals	Use marks and filters in Tableau to focus your visuals and highlight insights.
L13	Choosing and Customizing Chart Types in Tableau	Build a range of effective chart types in Tableau and customize them for clarity and impact.
L14	Advanced Grouping and Calculations	Create custom metrics and dynamic data groupings in Tableau using calculated fields, table calculations, groups, and sets.
L15	Working with Core Chart Types Review	Recap the essential Tableau concepts introduced in this lesson, including marks, filters, chart types, hierarchies, and grouping—reinforcing your understanding before diving deeper in future modules.
L16	Creating Interactive Dashboards and Stories Overview	Explore how dashboards and stories can bring multiple views of your data together, setting the stage for interactivity, deeper analysis, and compelling communication in Tableau.
L17	Creating Custom Dashboards	Build and customize dashboards in Tableau to bring together key charts, metrics, and layout elements for data storytelling.
L18	Interactive and Responsive Dashboard Design	Build engaging dashboards with filters, highlights, mobile layouts, and intentional design that guides decision-making.

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| L19 | From Exploration to Communication | Learn how to guide an audience through your insights with explanatory dashboards and Tableau Stories that communicate data clearly and persuasively. |
| L20 | Creating Interactive Dashboards and Stories Review | Reflect on how interactive dashboards and stories can enhance your data communication and prepare you to apply your Tableau skills with purpose and clarity. |
| L21 | Project:
Build Tableau Visualizations | In this project, you'll build an interactive Tableau dashboard to discover and communicate insights from data. |

Meet Your Instructors



Jayden Ziegler

VP of User Research and Design, Dynata

Jayden Ziegler is the VP of User Research and Design at Dynata. He also teaches about AI and language as an Adjunct Professor at Stanford University. Previously, he worked at Apple, Google, and Alembic Technologies. Jayden holds a PhD in psychology from Harvard University and a BA from Princeton University.



David Elliott

Data Scientist, Data Engineer

David Elliott is both a data scientist and a data engineer at a small data management company. He has extensive experience in education, both as an instructor and as a curriculum developer.



Derek Steer

CEO, Superframe

Derek is the CEO at Superframe, and former CEO at Mode. He developed an analytical foundation at Facebook and Yammer and is passionate about sharing it with future analysts.



Josh Bernhard

Staff Data Scientist

Josh has been sharing his passion for data for over a decade. He's used data science for work ranging from cancer research to process automation. He recently has found a passion for solving data science problems within marketplace companies.



Jennie Lytel-Sternberg

Data Analyst

Jennie is a data analyst with a background in environmental health, clinical research, and healthcare analytics. She has worked with several healthcare startups, helping teams turn complex health data into meaningful insights.

Why Udacity



Demonstrate proficiency with practical projects

Projects are based on real-world scenarios and challenges, allowing you to apply the skills you learn to practical situations, while giving you real hands-on experience

- ✓ Gain proven experience
- ✓ Retain knowledge longer
- ✓ Apply new skills immediately



24/7 access to real human support

Reviewers provide timely and constructive feedback on your project submissions, highlighting areas of improvement and offering practical tips to enhance your work

- ✓ Get help from subject matter experts
- ✓ Gain valuable insights and improve your skills
- ✓ Learn industry best practices