Data Science with Sheets Syllabus

High School - One Month (20 hours)

Course Overview and Goals

Industries of all types are hiring data scientists to analyze and highlight the hidden patterns in data. This course equips students with the fundamental skills of a data scientist which include data collection, cleanup, analysis, and visualization. Students will ask statistical questions, analyze data, and interpret data using Google Sheets. They will use the same tools that data scientists use to draw meaningful insights and solve organizational problems. Students will also learn about ethical considerations in the field of data science.

Learning Environment

This course utilizes a blended classroom approach. The content is fully web-based, with students working in Google Sheets and the CodeHS platform. Each module of the course is broken down into lessons. Lessons consist of video tutorials, short quizzes, example datasets to explore, and spreadsheet exercises. There is no programming in this course.

Prerequisites

The One Month Intro Data Science course has no prerequisites and is designed to be an entry-level course for students who are interested in data science. The course is highly visual, dynamic, interactive, and engaging.

More Information

Browse the content of this course at https://codehs.com/course/20933/explore

Course Breakdown

Module 1: What is Data Science? (2 days/2 hours)

Students will learn about the role of a data scientist and the iterative steps in the data science life cycle. This module serves as an introduction to the field of data science.

Objectives / Topics Covered	• What is Data Science? • The Data Science Life Cycle

Example Assignments	• What Does a Data Scientist Do?
	  ○ Explore the day-to-day operations of professional data scientists.
	• Exploring Data
	  ○ View different data visualizations to get a feel for the power of data.
	• Lookup, Compute, Relate
	  ○ Learn about the different types of questions that can be used in data.
	• What Stage?
	  ○ Determine what stage in the Data Science Life Cycle the scenarios are in.

	• Develop a Statistical Question

The Data Science Life Cycle (1-2 weeks/6-8 hours)

Students will learn and apply the process of the data science life cycle. This includes asking statistical questions, collecting or obtaining reliable data, analyzing the data, and summarizing the results.

Objectives / Topics Covered	• Spreadsheet Basics • Data Cleaning • Sorting and Filtering Data • Data Visualizations • Pivot Tables • Mean, Median, Mode

Example Assignments	• Basic Operations Exploration
	  ○ Explore rows and columns, ranges, formulas, comparison operators, text and number data types, currency and dates, and logic values.
	• Data Cleaning
	  ○ Address issues in data such as missing values, irrelevant data, formatting issues, and duplicate data.
	• Influential Women
	  ○ Practice sorting data and creating filters while learning about influential women.
	• Which Visualization is Best?
	  ○ Explore the variety of visualizations that exist in Google Sheets.
	  ○ Compare different visualizations for the same dataset to determine which visualizations work best for specific data.
	• Sneaker Boutique Sales
	  ○ Help identify items that generate the most revenue for a company by creating pivot tables
	• Unemployment Rates
	  ○ Discover the average unemployment rate in the U.S.

Data Ethics (3 days/2-3 hours)

Students will explore ethical considerations in the field of data science. This module focuses on teaching students about data privacy and how to work with data responsibly.

Objectives / Topics Covered	• Data Privacy • Big Data and Bias • Responsible Data Science

Example Assignments	• Minimizing and Anonymizing data
	  ○ Students learn how data minimization and anonymization help keep private information safe.
	• Big Data and Bias
	  ○ Explore cognitive biases.
	• Data Biographies
	  ○ Students explore what data biographies are and how they can help understand the origins and context of the data they use.
	• Responsible Data Science Life Cycle
	  ○ Students revisit the steps of the data science life cycle and identify what responsible data practices can be put in place in each step.

Data Storytelling (1 week/5-6 hours)

In this module, Students will use and analyze data to tell a data story. For their final project, they will create a visually appealing infographic that displays important data visualizations. The infographic will also tell a story based on their interpretation after exploring, analyzing, and visualizing the data.

Objectives / Topics Covered	● Data Storytelling ● Final Project
Example Assignments/Projects	● .Choosing a Narrative ○ Students explore different types of narratives they can use for their project. ● Final Project ○ For their final project, students will decide on a topic of their choice to explore the data science life cycle as a group. Throughout this process, students will be developing and answering statistical questions, collecting and processing data, creating insightful visualizations, and eventually communicating their findings through an accessible and engaging presentation.

Supplemental: What's Next?

Students will explore the next chapter in learning about data science and the careers that are available and growing.

Objectives / Topics Covered	● Data Science Pathways ● Artificial Intelligence ● Python Programming