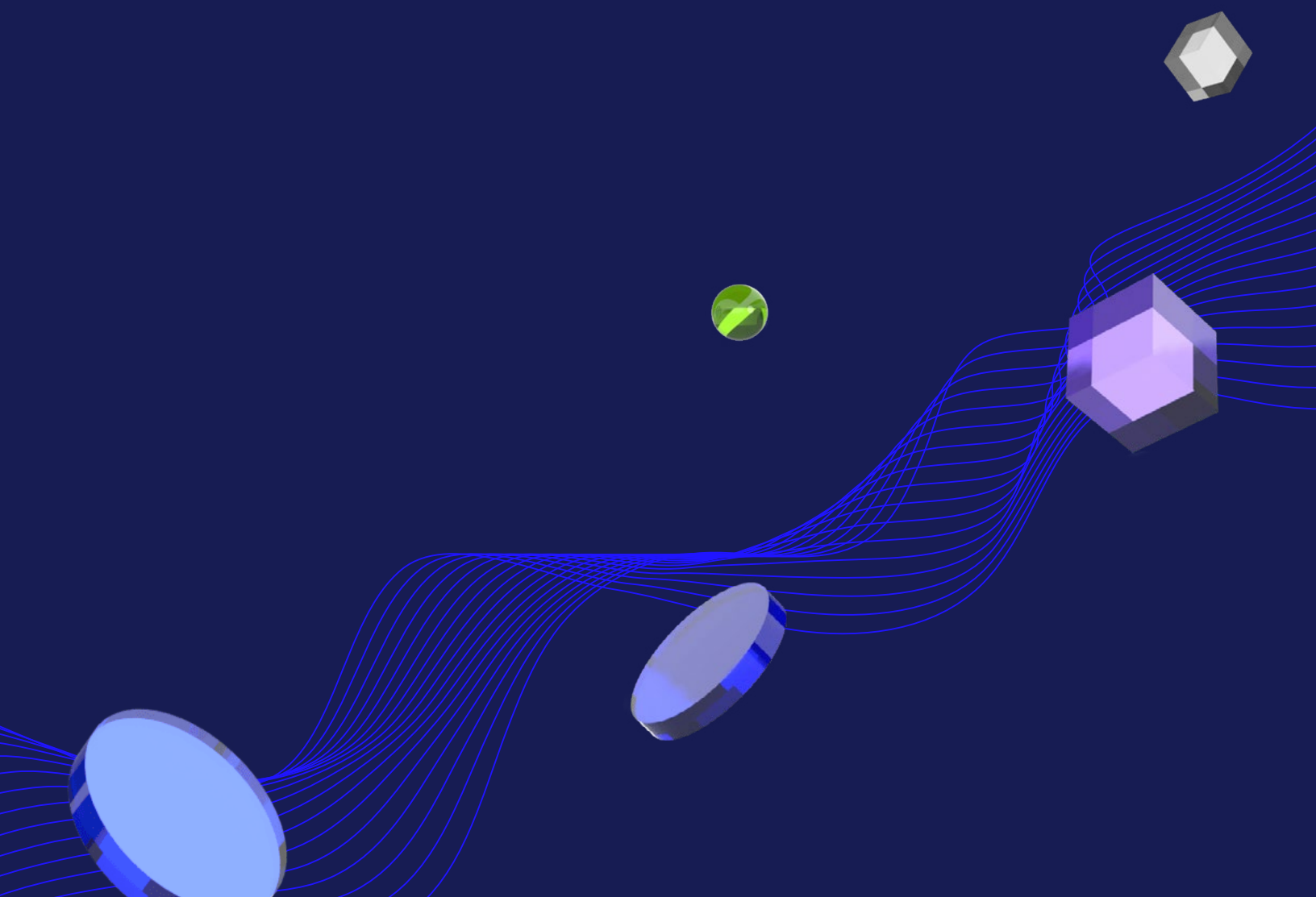
INDIVIDUAL LEARNERS

UDACITY

SCHOOL OF DATA SCIENCE

Statistics for Data Science

Course Syllabus



Overview

Learn how to apply inferential statistics and probability to real-world scenarios, such as analyzing A/B tests and building supervised learning models.

Built in collaboration with:

MODE

Program information

Estimated Time

1 month

Skill Level

Intermediate

Prerequisites

To be successful in this program learners should have basic Python and elementary algebra knowledge.

Required Hardware/Software

Learners will need access to the internet and a 64-bit computer. Additional software such as Python and its common data analysis libraries (e.g., Numpy and pandas) will be required, but the program will guide learners on how to download once the course has begun.

Course Project

Analyze A/B Test Results

In this project, learners will be provided a dataset reflecting data collected from an experiment. They'll use statistical techniques to answer questions about the data and report their conclusions and recommendations in a report.

Lesson 1

Simpson's Paradox

- Examine a case study to learn about Simpson's Paradox.

Lesson 2

Probability

- Learn the fundamental rules of probability.

Lesson 3

Binomial Distribution

- Learn about binomial distribution where each observation represents one of two outcomes.
- Derive the probability of a binomial distribution.

Lesson 4

Conditional Probability

- Learn about conditional probability, i.e., when events are not independent.

Lesson 5

Bayes Rule

- Build on conditional probability principles to understand the Bayes rule.
- Derive the Bayes theorem.

Lesson 6 **Standardizing**	• Convert distributions into the standard normal distribution using the Z-score. • Compute proportions using standardized distributions.
Lesson 7 **Sampling Distributions & Central Limit Theorem**	• Use normal distributions to compute probabilities. • Use the Z-table to look up the proportions of observations above, below, or in between values.
Lesson 8 **Confidence Intervals**	• Estimate population parameters from sample statistics using confidence intervals.
Lesson 9 **Hypothesis Testing**	• Use critical values to make decisions on whether or not a treatment has changed the value of a population parameter.
Lesson 10 **T-Tests & A/B Tests**	• Test the effect of a treatment or compare the difference in means for two groups when we have small sample sizes.
Lesson 11 **Regression**	• Build a linear regression model to understand the relationship between independent and dependent variables. • Use linear regression results to make a prediction.
Lesson 12 **Multiple Linear Regression**	• Use multiple linear regression results to interpret coefficients for several predictors.
Lesson 13 **Logistic Regression**	• Use logistic regression results to make a prediction about the relationship between categorical dependent variables and predictors.

Meet your instructors.

Josh Bernhard

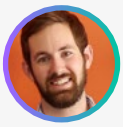
Data Scientist at NerdWallet

Josh has been sharing his passion for data for nearly a decade at all levels of university, and as lead data science instructor at Galvanize. He's used data science for work ranging from cancer research to process automation.

Sebastian Thrun

Founder & Executive Chairman

As the founder of Udacity, Sebastian's mission is to democratize education. He is also the founder of Google X, where he led projects including the Self-Driving Car, Google Glass, and more.



Derek Steer

CEO at Mode

Derek is the CEO of Mode Analytics. He developed an analytical foundation at Facebook and Yammer and is passionate about sharing it with future analysts. He authored SQL School and is a mentor at Insight Data Science.

Juno Lee

Data Science Instructor

As a data scientist and Technical Curriculum Developer, Juno built a recommendation engine to personalize online shopping experiences, computer vision and natural language processing models to analyze product data, and tools to generate insight into user behaviour.

Mike Yi

Data Analyst Instructor

Mike is a content developer with a multidisciplinary academic background, including math, statistics, physics, and psychology. Previously, he worked on Udacity's Data Analyst Nanodegree program as a support lead.

David Venturi

Data Analyst Instructor

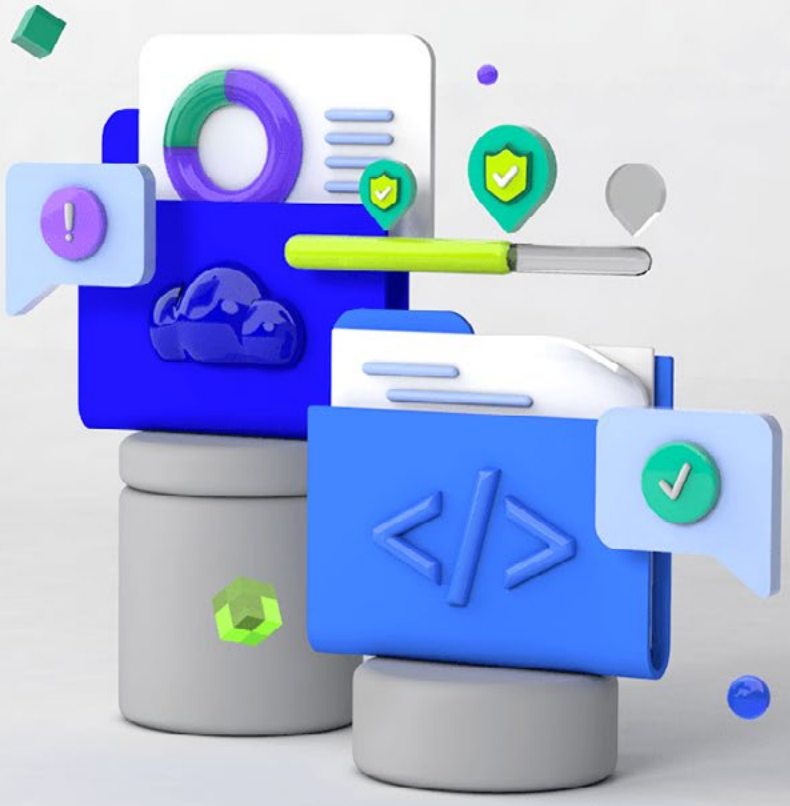
Formerly a chemical engineer and data analyst, David created a personalized data science master's program using online resources. He has studied hundreds of online courses and is excited to bring the best to Udacity students.

Sam Nelson

Product Lead

Sam is the product lead for Udacity's Data Analyst, Business Analyst, and Data Foundations programs. He's worked as an analytics consultant on projects in several industries and is passionate about helping others improve their data skills.

Udacity's learning experience



Hands-on Projects

Open-ended, experiential projects are designed to reflect actual workplace challenges. They aren't just multiple choice questions or step-by-step guides, but instead require critical thinking.

Quizzes

Auto-graded quizzes strengthen comprehension. Learners can return to lessons at any time during the course to refresh concepts.

Knowledge

Find answers to your questions with Knowledge, our proprietary wiki. Search questions asked by other students, connect with technical mentors, and discover how to solve the challenges that you encounter.

Custom Study Plans

Create a personalized study plan that fits your individual needs. Utilize this plan to keep track of movement toward your overall goal.

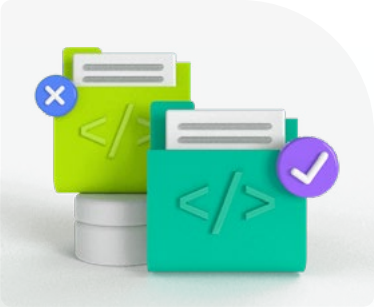
Workspaces

See your code in action. Check the output and quality of your code by running it on interactive workspaces that are integrated into the platform.

Progress Tracker

Take advantage of milestone reminders to stay on schedule and complete your program.

Our proven approach for building job-ready digital skills.



Experienced Project Reviewers

Verify skills mastery.

- Personalized project feedback and critique includes line-by-line code review from skilled practitioners with an average turnaround time of 1.1 hours.
- Project review cycle creates a feedback loop with multiple opportunities for improvement—until the concept is mastered.
- Project reviewers leverage industry best practices and provide pro tips.

Technical Mentor Support

24/7 support unblocks learning.

- Learning accelerates as skilled mentors identify areas of achievement and potential for growth.
- Unlimited access to mentors means help arrives when it's needed most.
- 2 hr or less average question response time assures that skills development stays on track.

Mentor Network

Highly vetted for effectiveness.

- Mentors must complete a 5-step hiring process to join Udacity's selective network.
- After passing an objective and situational assessment, mentors must demonstrate communication and behavioral fit for a mentorship role.
- Mentors work across more than 30 different industries and often complete a Nanodegree program themselves.

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Learn more at

www.udacity.com/online-learning-for-individuals →

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