



# Data Science Career Track

Syllabus & Course Overview

## Introduction

Data science is one of the fastest-growing fields of this decade. The amount of data created each day has surged thanks to the ubiquitous storage of everything from health records to the millions of actions taken on websites and mobile devices. Being able to make sense of all this data — and thus drive intelligent, outcomes-focused decisions — is an immensely important skill, and one that is at the heart of being a data scientist. Learning data science is one of the best career investments you can make. In fact, according to LinkedIn, statistical analysis and data mining were two of the most sought-after skills recruiters looked for last year.

**Springboard's Data Science Career Track** is our most intensive course to date, with a 500+ hour curriculum designed around three portfolio-worthy capstone projects. You'll learn the Data Science Method — the process that leads to successful data science projects — and have the option to choose from one of three specialization tracks where you can learn skills that will help you stand out from the data science pack. You'll also have access to mock interviews, dedicated community managers, course TAs, and 1-on-1 sessions with career coaches to help you succeed.

In fact, we're so confident that this program will launch you into a data science career that we'll refund your tuition if you don't find a job within 6 months of graduating!

## Prerequisites

You should have a strong background in probability & statistics and should be very comfortable programming in any language. We recommend at least 6 months' experience in 1 language with 5000 or more lines of code. If you don't meet these requirements, check out our [Data Science Career Track Prep](#) course instead.

## How our job guarantee works

We work with you to supplement your learning efforts to ensure a successful job search after completion. If you meet our criteria, we guarantee that you will be offered a job in a data science or analytics field within 6 months of graduating from the course, or your tuition back. More details of the job guarantee are available [here](#).

## Admission Process



### **1. Submit your application**

Fill out our application form to get started. There is no application fee. It takes about 10-15 minutes. You should expect a reply in 2-3 business days.



### **2. Pass the challenge**

If it's a fit, we'll send you a challenge to test your statistics and programming knowledge. Applicants spend up to 3 hours on the challenge.



### **3. Reserve your spot**

If you pass the challenge, we will send you a registration link. Choose the start date and payment plan that works for you (we can help!).



### **4. Join the program**

You'll be one of fewer than 20% of applicants who secured a spot in the Data Science Career Track. Congratulations!

## How it works

**1. Cost and schedule:** The course costs **\$7,500 and runs for 6 months**. We also have a per-month payment plan and financing options. It is fully online, and allows you to study anywhere and anytime you want. You'll have 30min video calls with your mentor every week, and continued access to your Springboard account and online community after you graduate.

**2. Enrollment:** Once your application is accepted, we'll send you a custom link to make the payment and enroll. We have cohorts starting every month, and you can enroll for a future cohort.

**3. Mentor-matching process:** Once you enroll, you'll be asked to fill out a profile in which you'll write a short bio about yourself, your availability during the week, and the skills you want to develop. Your Student Advisor will use this information to match you with a mentor who suits your specific needs.

**4. Curriculums curated by experts:** Diverse perspectives lead to better learning outcomes. Our **500+ hour** expert-curated curriculum is curated by data science experts from **Dell, Cisco, and Pindrop Security** - from the best sources on the web (tutorials, videos, podcasts, papers, articles, and some optional books), and updated to reflect new industry trends and hiring needs.

**5. Practice concepts through projects:** A lot of your time will be spent working on hands-on projects and applying what you're learning. Working with your mentor, you will get experience with real business problems and datasets.

**6. Career Services:** You will get career resources as part of the curriculum, as well as 1-on-1 video calls with a career coach, where you will cover resume review, mock interviews, and salary negotiation tips and more

**7. Graduating from the course:** You will exhibit your data science skills through your **Capstone Projects** which will be approved by your mentor. Once you complete all other assignments, you will receive a certificate that describes your learning. You can even add this to your LinkedIn profile!

## Why is mentorship important?

Mentors hold students accountable, help them grow, and impart real-world knowledge and advice. **Research shows that having a mentor makes you 5 times more likely to get promoted and more likely to get a raise.**

Our mentors are experienced professional Data Scientists who are motivated by a desire to give back to their communities. We select them based on a combination of professional experience, educational background, skills-based competencies, and a portfolio of work. More importantly, we look for empathetic individuals with top-notch communication abilities, and an intrinsic love of teaching.

## Some of our mentors



**Ryan Rosario**  
Machine Learning Engineer

facebook



**Eric Rynerson**  
Data Scientist

 instacart



**Sameera Poduri**  
Principal Data Scientist

JAWBONE



**Ike Okonkwo**  
Sr. Data Scientist

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## Units – What you'll learn

Each unit of this course will cover a key data science concept and the skills associated with that concept. The units feature a combination of materials: projects, lectures, theory, coding exercises, reading/viewing exercises, and career-related coursework. The recommended time allocation is based on a total of 500 hours of work, and can be scaled according to student needs.

### The Data Science Method

The course centers around the Data Science Method. **This method involves six steps:**

1. **Problem Identification** - this step involves identifying the correct problem to solve and setting goals for your project.
  - a. You'll learn how to create a SMART problem statement and form hypotheses about the problem.
2. **Data Wrangling** - this step involves the collection, organization, and definition of a dataset or datasets.
  - a. You'll learn how to compile data, build local file structures, create data profiles, resolve formatting issues, and more.
3. **Exploratory Data Analysis** - this step involves creating plots and charts to understand the relationship between data and the features of that data.
  - a. You'll learn how to create data visualizations in Python and use statistics to identify patterns.
4. **Pre-processing and Training Data Development** - this step involves standardizing and training your dataset.
  - a. You'll learn how to remove out-of-value ranges and create testing and training subsets of your data.
5. **Modeling** - this involves selecting, training and deploying a model to make predictive insights.
  - a. You'll learn industry-standard algorithms to build models.
6. **Documentation** - this involves documenting the work you've done and sharing your findings.
  - a. You'll learn how to create a project report and present your findings.

Each of these steps is examined in detail in one or more units of the course. You'll learn about each step and apply your new knowledge to hands-on work related to each of your three capstone projects.

**In addition to the steps of the Data Science Method, you will also find units dedicated to the following topics:**

### **The Python Data Science Stack**

Python has become the lingua franca of data science. In this section of the course, you'll learn to program in Python, how to follow best coding practices, and start using an ecosystem of useful and powerful Python-based tools.

#### **Topics covered:**

1. Python data types, foundations, and standard libraries
  2. pandas
  3. Visualization tools in Python like matplotlib and Seaborn
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### **SQL and Databases**

In this section of the course, you'll learn how to leverage Structured Query Language (SQL) to query relational database management systems. In other words, you'll use queries to understand the data contained in databases.

#### **Topics covered:**

1. The landscape of SQL and databases
  2. Writing queries in SQL
  3. Working with relational databases in Python
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### **Data Storytelling**

If there's one thing that most data scientists would have loved to know before they entered the field, it's that data science is not just about the math, the algorithms and the analysis, it's also about telling a good story. In real life, data scientists don't work in a vacuum - there's always a client, internal or external, waiting on the results of their work.

A data story is a powerful way to present insights to your clients, combining visualizations and text into a narrative. But storytelling is an art, and needs creativity. This

section will try to get your creative juices flowing by suggesting some interesting questions you can ask of your dataset, and will cover a few plotting techniques you can use to reveal insights.

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### **Statistical Inference**

Statistics is the mathematical foundation of data science. Within statistics, inferential statistics is a set of techniques that helps us identify significant trends and characteristics of a data set. Not only is it useful to explore the data and tell a good story, it also paves the way for deeper analysis and actual predictive modeling. In this module, we cover several important inferential statistics techniques in detail.

#### **Topics covered:**

1. Theory of inferential statistics
  2. Statistical significance
  3. Parameter estimation
  4. Hypothesis testing
  5. Correlation and regression
  6. Exploratory data analysis
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### **Machine Learning**

Machine learning combines aspects of computer science and statistics to extract useful insights and predictions from data. Machine learning is what lets us make useful predictions and recommendations, or automatically find groups and categories in complex data sets.

In this section of the course, you'll learn and use the major supervised and unsupervised machine learning algorithms. You'll learn when to use these algorithms, the assumptions they incorporate, the tradeoffs they involve, and the various metrics you can use to evaluate how well your algorithm performs.

#### **Topics covered:**

1. The landscape of machine learning



2. Supervised learning and the most popular algorithms, including linear and logistic regression, support vector machines, decision trees, clustering, time series and forecasting, ensemble learning with random forests and gradient boosting
  3. Unsupervised learning and the most commonly used clustering techniques, including k-means clustering, agglomerative hierarchical clustering, Euclidean & Manhattan distances, cosine similarity, and principal components analysis
  4. Machine learning model evaluation and optimization
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## **6. Career Resources (35+ hours)**

You'll receive career material at strategic points both in the curriculum as well as via calls with our career support coaches. We'll help you create a tailored job search strategy based on your background and goals, teach you how to evaluate companies and roles, show you how to effectively get and ace interviews, and explain how to negotiate an above-market salary.

### **Topics covered:**

1. Anatomy of a tech company
  2. Job search strategies that top candidates use
  3. How to build your network and effectively use it to land interviews
  4. Create a high-quality resume, LinkedIn profile and cover letter
  5. Interview coaching and practice, including mock interviews for both technical and non-technical topics
  6. Negotiation success tips
  7. Practice interview questions for each technical topic
  8. Algorithms and data structures to ace your coding interviews
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## Capstone Projects: Building a Data Science Portfolio

120+ hours

Capstone projects are a great way for you to practice the skills you'll need during your first data science job and demonstrate your knowledge and experience to potential employers. While working through this course, you'll complete **three capstone projects** to showcase your talents.

### Guided Capstone (Capstone One) 23 + hours

Your first capstone project comes up fairly early in the course. For this project, you'll be given a lightweight introduction to each step of the Data Science Method. You'll then be guided through each of those steps with helpful tips and instructions. This first capstone is designed to build your foundational understanding of each of these important steps, while also giving you an opportunity to practice each step before applying your knowledge to your second capstone.

### Capstone Two 50+ hours

Your second capstone project follows the same Data Science Method steps as the first capstone, but this time with less guidance. You'll be asked to:

- Come up with a project idea and proposal
- Find and wrangle data
- Use exploratory data analysis techniques to understand that data
- Pre-process and create a training dataset
- Build a working model
- Document and present your work

Each of these steps will be their own submission and are interwoven throughout the core units of the course.

### Capstone Three 50+ hours

For your third capstone, you'll again work through each step of the Data Science Method, but this time you'll choose a project idea that aligns with the specialization track that you choose. You'll learn more about these tracks and your third capstone in the next section.

## Choose your specialization track

Hone your skills in a specific area of expertise by **choosing one** of our three specialization track options.

### Option 1: The Generalist Track

This track will prepare you to take on versatile data science roles across a wide variety of business domains and geographical locations. You'll build on the foundational skills you learned in the core units and tackle more advanced topics like working with Big Data and software engineering best practices.

#### Topics covered:

1. Advanced time series analysis
2. Machine learning topics (*please note that you will be asked to choose to learn one of the topics listed below. The other topics will be optional*)
  - a. Natural Language Processing (NLP)
  - b. Image processing
  - c. Recommendations systems
  - d. Network analysis
3. Data science at scale, including:
  - a. Hadoop
  - b. Spark and PySpark
  - c. Neural networks
4. Machine learning in the cloud
5. Software engineering for data scientists

#### Capstone Project Estimated time: 50 hours

You'll be asked to develop your third capstone around one of the topics covered in this track, including time series analysis, image processing, or natural language processing. You can choose to use machine learning algorithms you learned in the core units and apply them to Big Data using at-scale approaches like Spark or through the use of a cloud machine learning platform. Implementing data science methods on these advanced

platforms is one way to demonstrate your advanced data science knowledge — we encourage you to do this if you choose not to use a dataset that includes more advanced formats like images.

## Option 2: The Business Insider Track

The goal of this track is to teach you advanced data visualization and business analytics skills to extract actionable business insights. While you will have the ability to build predictive machine learning models, you'll primarily focus on learning how to identify insights and effectively communicate recommendations.

### Topics covered:

1. Structured thinking, including the use of:
  - a. Issue trees
  - b. Value Driver Trees
2. Business analytics, including:
  - a. A/B testing
  - b. Customer segmentation
  - c. Data-driven metrics
3. Advanced data visualization during which you will learn to use the following tools:
  - a. Tableau
  - b. Plotly
  - c. Bokeh
  - d. D3.js
4. Advanced SQL

### Capstone Project Estimated time: 50 hours

Your third capstone should focus on a business problem that you can use your advanced analytics, visualization, and SQL skills to solve. Remember, this track is all about identifying actionable insights that have a significant impact on a company. While you are not yet working for a company, choosing a topic that solves a business problem will help you demonstrate your skills to potential employers.

### Option 3: The Advanced Machine Learning Track

The goal of this track is to teach you advanced machine learning skills and concepts, including deep learning and the deployment of machine learning models on standard industry platforms. If you want to broaden your machine learning skills, this track may be the right one for you.

#### **Topics covered:**

1. Advanced time series analysis
2. Deep learning, including:
  - a. Deep learning implementation
  - b. Neural network architectures
3. Production machine learning methods
  - a. Deploying models
4. Advanced machine learning topics:
  - a. Natural Language Processing (NLP)
  - b. Image processing
  - c. Recommendations systems
  - d. Network analysis
5. Data science at scale, including:
  - a. Hadoop
  - b. Spark and PySpark
  - c. Neural networks

#### **Capstone Project** Estimated time: 50 hours

You'll be asked to focus your capstone on one of the specialized topics covered in this unit, including (but not limited to) deep learning, image processing, or time series analysis. We encourage you to plan to implement advanced machine learning methods on an advanced platform like Paperspace or an API application.

## Not sure if your background is a fit?

[Schedule a call](#) with our Admissions team or [email](#) Fabiola, our Admissions Manager, who will help you think through the decision.



**Ready for the next step? Learn more and [apply here](#).**

Email us at **[hello@springboard.com](mailto:hello@springboard.com)** with any questions.