

SYLLABUS

Online Data Science Immersive

Table of Contents

3	Overview
4	Why Data Science?
5	Curriculum Overview & Prework
6	- Module 1: Introduction to Data with Python and SQL
7	- Module 2: Statistics, AB Testing and Linear Regression
8	- Module 3: Machine Learning
9	- Module 4: Big Data, Deep Learning and Natural Language Processing
10	- Module 5: Final Project - Data Science Advanced Project
12	Program Pace & Schedule
13	Contact Us

Overview

FLATIRON SCHOOL'S ONLINE DATA SCIENCE IMMERSIVE

This program will provide you with the knowledge, skills, and experience to get a job as a data scientist – which requires a mix of software engineering, statistical understanding, and the ability to apply both skills in new and challenging domains.

Over the course of Flatiron School's online data science immersive, you'll learn how to gather data, apply statistical analysis to answer questions with that data, and to make your insights and information as actionable as possible. Our pedagogy ensures not only job readiness for today's market, but the aptitude and skills to keep learning and stay relevant in the industry in the years ahead.

What will you learn?

- How to retrieve data from outside sources and organize data using Python
- Create beautiful visualizations to present key findings
- Explore data and write down multiple hypotheses for further analysis of the data
- Perform A/B tests
- Build machine learning API that outputs results of an analysis
- Apply and use Big Data
- Learn Presentation techniques to better share conclusions about approach and analysis to key stakeholders

When and where does the course meet?

Online data science is available in three different course lengths:

- Full-time - 50 hours per week, completed in 5 months
- Part-time - 25 hours per week, completed in 10 months
- Self-paced - Flexible hours, up to 15 months for completion

All instruction is held within Learn.co, the proprietary online learning platform that powers the Flatiron School online experience.

Why Data Science?

WHY IS THIS COURSE RELEVANT?

More than ever before, industries are capturing data on a variety of topics, behaviors, and trends. Without data science, this information stays stuck, without a story to tell or insights to share. In order to determine business goals, more and more companies are looking to data scientists to fill in the gaps and find opportunities never before considered.

Over the last four years, the rise of job opportunities for Data Scientists has increased exponentially.

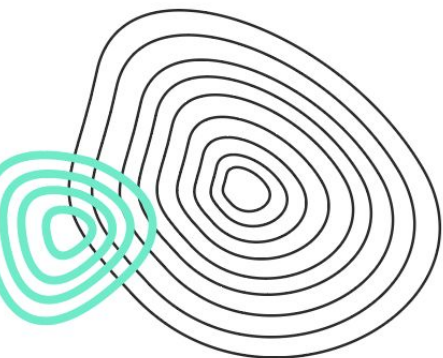


Note: The chart above offers a 7-day rolling mean of all Indeed job posts that featured "data science" or "data scientist" in the title across the world as a percentage of all job posts between January 1, 2014 and November 16, 2017. The data was pulled using Imhotep, Indeed's open source analytics platform.

As this area of expertise has grown, the positions within the field have become more nuanced. After completing our online data science immersive, you'll not only be able to secure a job as a Data Scientist, but can also consider pursuing any of the following related positions:

- Data Analyst
- Data (Science) consultant
- Business Analyst
- Data Engineer

Curriculum Overview



From Python to Machine Learning, our online data science immersive gives you the breadth and depth needed to become a well-rounded data scientist. You'll learn the languages, skills, and processes used by data scientists today and graduate with an understanding of how to discover new techniques as your career progresses.

You'll be introduced to a new module that builds off the learnings of the previous section while allowing you enough time to dive into each area for a thorough understanding of the subject matter.

Module	Student Hours
Module 1	Introduction to Data with Python and SQL
Module 2	Statistics, AB Testing and Linear Regression
Module 3	Machine Learning
Module 4	Big Data, Deep Learning, & Natural Language Processing
Module 5	Data Science Advanced Project

Getting Started

The online data science immersive moves quickly and our passionate students embrace that challenge. While no experience is necessary to apply, we require you to demonstrate some data science knowledge prior to getting admitted, then complete a prework course before Day 1. To help you prepare for our bootcamp, we provide a free introductory course. This prework ensures that you come in prepared and able to keep pace with the class.

MODULE 1

Introduction to Data with Python and SQL

Our first module introduces the fundamentals of Python for data science. You'll learn basic Python programming, how to use Jupyter Notebooks, and will be familiarized with popular Python libraries that are used in data science, such as Pandas and NumPy. Additionally, you'll learn how to use Git and Github as a collaborative version control tool. To organize your data, you'll learn about data structures, relational databases, ways to retrieve data, and the fundamentals of SQL for data querying for structured databases. Furthermore, you'll learn how to access data from various sources using APIs, as well as perform Web Scraping.

Finally, we'll conclude with a heavy focus on visualizations as a way to go from data to insights. At the end of this module, students will use their newly learned skills to collect, organize and visualize data, with the goal to provide actionable insights!

What is Covered in Module 1?

- Variables
- Booleans and Conditionals
- Lists
- Dictionaries
- Looping
- Functions
- Data Structures
- Data Cleaning
- Pandas
- NumPy
- Matplotlib/Seaborn for Data Visualization
- Git/Github
- SQL
- Accessing Data through APIs
- Web Scraping

MODULE 2

Statistics, AB Testing, and Linear Regression

Having learned how to gather and explore data with Python and SQL you can now go deeper into analyzing that information with statistics. In this module, you'll learn about the fundamentals of probability theory, where you will learn about probability principles such as combinations and permutations. You will go on and learn about statistical distributions and how to create samples when distributions are known. By the end of this module, you will be able to apply this knowledge by running AB tests. Additionally, you'll learn how to build your first (and important) data science model: a linear regression model.

What is Covered in Module 2?

- Combinatorics
- Probability Theory
- Statistical Distributions
- Bayes Theorem
- Sampling Methods
- Hypothesis Testing
- AB Testing
- Linear Regression
- Model Evaluation

MODULE 3

Machine Learning

Module 3 is all about machine learning, with a heavy focus on supervised learning. To start, you will go a little deeper into regression analysis, learning about extensions to linear regression, and a new form of regression: logistic regression. In building regression models, students will learn about penalization terms, preventing overfitting through regularization and using cross validation to validate regression model.

Next, you'll learn how to build and implement the most important machine learning techniques. You'll learn about classification algorithms such as Support Vector Machines and Decision Trees. Additionally, you'll learn how to build even more robust classifiers using ensemble methods such as Bagged and Boosted Trees, and Random Forests.

What is Covered in Module 3?

- Linear Algebra
- Logistic regression
- Maximum Likelihood Estimation
- Optimization Cost Function
- Pipeline Building
- Hyperparameter Tuning
- Grid Search
- Scikit-Learn
- Gradient Descent
- K Nearest Neighbors
- Decision Trees
- Ensemble Methods

Big Data, Deep Learning & Natural Language Processing

After a full module on supervised learning, this module focuses on a variety of advanced Data Science techniques. You will start with learning about unsupervised learning techniques such as clustering techniques and dimensionality reduction techniques. Next, you will be introduced to threading and multiprocessing to be able to work with big data. In doing so, you'll learn about PySpark and AWS, and how to use those tools to build a recommendation system. Next, you will get an in-depth overview of deep learning techniques, learning about densely connected neural networks, enabling high-performing classification performance. Next, students will learn how to use regular expressions in Python, and how to manage string values, analyze text and perform sentiment analysis.

What is Covered in Module 4?

- Dimensionality Reduction
- Clustering
- Times Series Analysis
- Neural Networks
- Big Data
- Natural Language Processing
- Text Vectorization
- Natural Language Toolkit
- Regular Expressions
- Word2Vec
- Text Classification
- Recommendation Systems

MODULE 5

Data Science Advanced Project

In your final project, you'll work individually to create a large-scale data science and machine learning project. This final project provides an in-depth opportunity for you to demonstrate your learning accomplishments and get a feel for what working on a large-scale data science project is really like.

You and your fellow students will each pitch three different ideas and then decide on your final project with your instructors. Instructors advise on projects based on difficulty and feasibility given the course's time constraints. At the end of the project, you'll receive a grade based on various factors.

Upon project completion, you'll know how to construct a project that gathers and builds statistical or machine learning models to deliver insights and communicate findings through data visualisation and storytelling techniques.

The Flatiron School Online Experience

BRINGING THE BOOTCAMP ONLINE

Flatiron School has helped hundreds of online students get jobs as software engineers through our rigorous coursework and portfolio projects. For our online data science immersive, we've applied the same curriculum discipline, paired with our proprietary online learning platform, Learn.co, and a network of dynamic educators available at your fingertips.

STUDY GROUPS

Live Discussions*: In these interactive workshops, instructors present technical topics and live-code – with students encouraged to participate

Coding Office Hours*: Ask instructors technical questions – and see what other students are struggling with – in these open sessions

Assigned Peer Group*: Online classmates are encouraged to study, collaborate, and keep each other motivated as they work through the course together.

1:1 SUPPORT

Real-time Support: When you're stuck, click the Ask a Question button for on-demand help from your fellow students

Educational Coaching: Partner with a dedicated Coach to help you set and stay accountable to your goals, and make steady progress at a pace that is right for you

Technical Mentorship: Schedule 1:1 video calls with your Section Lead to get help breaking through tough technical concepts

LEARN.CO FEATURES

Real Tools: You can't learn real skills without real tools. Students learn how to code in our Learn.co environment and practice with a git-based workflow

Real-time Support: Confused? Our Ask a Question feature within Learn.co allows students to crowdsource support from the entire student community. Even when not in class, you have the support you need.



**Features available only with our Full-Time and Part-Time Online Data Science courses.*

Program Pace & Schedule

At Flatiron School, we know that how you choose to study is as integral to your success as what you're learning. Paired with our proprietary online learning platform, Learn.co, and individualized support from an Educational Coach, all students have access to a personalized learning experience. Choose from three different program options, each tailored to today's online learner.

	FULL-TIME <i>(20:1 student ratio)</i>	PART-TIME <i>(40:1 student ratio)</i>	SELF-PACED
Length	5 months	10 months	Up to 15 months
Time Commitment	45-50 hr/week	20-25 hr/week	100% flexible
Admissions	Cultural + Technical Interview	Cultural + Technical Interview	Cultural Interview
Career Services Support	YES	YES	YES
1,000+ Curriculum Hours	YES	YES	YES
Ask A Question	YES	YES	YES
Educational Coaching	YES	YES	YES
Live Lectures	YES	YES	YES
Assigned Cohort	YES	YES	
Technical Mentorship	1 hr/week	30 min/week	
WeWork Hot Desk Membership	YES	YES	YES
Money-back Guarantee	YES	YES	YES

In addition, students also receive access to alumni network, lifetime Learn.co curriculum access, instant support with Ask a Question.

Contact Us

For more information, please check out our website at www.flatiron-school.com or contact us at admissions@flatiron-school.com