Curriculum Overview

Over the course of the past decade, the explosion of data has transformed nearly every industry known to man. Whether it’s in marketing, healthcare, government, or activism – the ability to translate data into insights has quickly become a highly in-demand skill by all. The USC Viterbi Data Analytics Boot Camp is a part-time, 26-week non-degree continuing education program that will empower you to gain the knowledge and skills to conduct robust analytics on a host of real-world problems.

The program is designed to fit into your life with convenient weekend and evening sessions.

The program is rigorous, fast-paced, and focused on the practical technical skills needed to solve data problems. Throughout the course, you’ll be gaining proficiencies on a host of marketable technologies like Excel, Python, JavaScript, SQL Databases, Tableau, and more. Plus, you’ll have an impressive Professional Portfolio and the confidence you need to succeed in the data driven economy.
Are you a creative, curious, and ambitious professional looking to join the data revolution? If so, or if any of the following describes your situation, enrolling in our Data Analytics Boot Camp could be a smart career move:

You are currently a professional working with data, and are looking to advance your career by building technical skills.

You are a manager or professional in a business where data can be used to boost your company’s bottom line.

You have interests in visualizing social, consumer, or popular trends.

You are looking to enter a new field in healthcare, government, or media and are looking for a way to jump in.

You are a student, hungry to learn more and expand your skill set.
The **Skills** You’ll Gain

You will complete the program with skills in Data Visualization and Analytics, including*:

**Advanced Excel**
- Pivot Tables
- VBA Scripting

**Fundamental Statistics**
- Modelling
- Forecasting

**Python Programming**
- Python 3
- NumPy
- Pandas
- Matplotlib
- API Interactions
- Social Media Mining

**Databases**
- SQL
- MongoDB
- ETL

**Front-End Web Visualization**
- HTML
- CSS
- Bootstrap
- Dashboarding
- JavaScript Charting
- D3.js
- Geomapping with Leaflet.js

**Business Intelligence Software**
- Tableau

**Advanced Topics**
- Big Data Analytics with Hadoop
- Machine Learning

* Note: These topics are subject to change based on local market demand and the input of hiring partners.
Building On The Basics

For those first entering the field of Data Analytics, knowing where to start can be a daunting task. That's why our curriculum is designed to provide you with a deep foundation on the core technical skills needed to succeed in the field. Throughout the program, expect to learn brand new skills and be challenged in completing difficult “real-world” problems to demonstrate your new abilities. By the program’s end, you will have a strong professional portfolio showcasing your work.
Our students will be qualified for many different roles, including:

<table>
<thead>
<tr>
<th>Data Analyst</th>
<th>Systems Engineer</th>
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<tbody>
<tr>
<td>Data Engineer</td>
<td>Database Administrator</td>
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<tr>
<td>Data Scientist</td>
<td>Big Data Engineer</td>
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<tr>
<td>Data Journalist</td>
<td>Business Intelligence Analyst</td>
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<td>Business Analyst</td>
<td>Research Analyst</td>
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<td>SQL Developer</td>
<td>Software Engineer</td>
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What You Will Learn

By the time you complete the program, you can expect to be able to:

- Employ statistical analysis to model, predict, and forecast trends
- Expertly build VBA scripts in Excel to automate tedious manual processes
- Utilize real-world data sources to showcase social, financial, and political phenomena
- Create Python-based scripts to automate the cleanup, re-structuring, and rendering of large, heterogeneous datasets
- Interact with RESTful APIs using Python Requests and JSON parsing techniques
- Create in-depth graphs, charts, and tables utilizing a wide-variety of data-driven programming languages and libraries
- Use ETL process (Extract, Transform, Load) to transform and consolidate data from multiple sources
- Use geographic data to create visually exciting, interactive, and informative maps
- Build custom interactive data visualizations using D3.js and other JavaScript libraries
- Write SQL commands to perform Create, Read, Update, and Delete commands
- Use advanced SQL and Mongo techniques to combine multiple datasets into one so as to create even more impressive and comprehensive databases
- Create basic interactive websites and applications to show your work to the entire world
- Work with and lead small-scale teams in order to create applications and visual datasets
- Scrape information from web pages in order to collect data from a wide variety of online sources
- Communicate and glean new business insights using enterprise-grade tools like Tableau
- Analyze social media trends using automated programs
- Work independently or in a group on complex data-mining projects
- Understand the basics of troubleshooting and enhancing legacy code
Course Structure

Over the course of 26 weeks, you’ll attend informative lectures, participate in a variety of individual and team exercises, and work independently in the classroom and at home. Homework assignments provide an opportunity to apply what you’ve learned and build on it. The goal is to give you a comprehensive learning experience and true insight into a “day in the life” of a data professional.

DISCUSSION

Instructor-led discussions cover the background, history, and use new technologies or concepts.

PROJECT WORK

You’ll work on timed in-class exercises and projects individually and in teams to put classroom teachings into practice.

PORTFOLIO PROJECTS

Your portfolio signals to employers that you are ready for primetime! You’ll build a substantial portfolio of projects that demonstrate your abilities across a wide variety of technologies.
We’re Here To Help

As you move up the learning curve, you’re likely to have questions around some of the concepts covered in class. We’re here to help—through in-person and virtual office hours, as well as a dedicated #slack channel where you can get assistance from instructors, support staff and your fellow students. All work is done via Github, so you can create issues directly on your own projects for instructors to assist you in a truly asynchronous fashion. In addition to learning data analytics, you will have access to Trilogy Education Services’ career services that will help you prepare for technical roles after the program such as:

**Career Content and Practice Sessions**

**Online Career Events With Industry Professionals**

**Database of Customizable Tools and Templates**
- Multiple Technical Resume Templates
- Github Best Practices
- Guidelines To Building A Portfolio
- Creating an Elevator Pitch
- Developing a Bio

**Soft Skills Training**

**One-on-One Career Coaching**
Building Your Portfolio

It’s a fact: companies care about what you can do, not what you say you can do. For that reason, our curriculum teaches you how to put what you’ve learned to work on real-world data projects, ranging from visualizing bike sharing data in New York City to mapping worldwide earthquakes in real-time.
Bank Deserts

Social economists have long noted a trend that in geographic areas with higher poverty rates, there is often a dearth of reputable banks or financial services. The shortage leads to higher rates of financial victimization in these areas. But how could we show this trend using data? In this activity, you’ll learn how to combine data from the US Census, Google Maps, and Google Places to visualize the relationship between various socioeconomic factors and the number of banks in a given zip code.

Skills Needed
- Python
- Pandas
- Google Maps
- Google Places
- Matplotlib
- APIs

Objectives
- Utilize the Python Requests library to make hundreds of API calls to the US Census and Google Maps datasets
- Utilize the Python pandas library to organize the retrieved information by zip code and socioeconomic factors
- Build scatter plots to easily communicate the Banking Desert phenomena

Earthquake History

Data isn’t just about finance and numbers. It can also be used for good as well. In this activity, you will create an interactive visualization of historic earthquakes over time using Leaflet.js, a popular JavaScript geo-mapping library. Your final application will provide a near-live feed of global earthquakes and their relative magnitudes.

Skills Needed
- HTML
- CSS
- Javascript
- Leaflet.js
- APIs
- JSON

Objectives
- Harness the power of APIs and JSON to gather earthquake data from USGS datasets
- Utilize Leaflet.js library to create visually compelling, animated maps
- Embed the created map onto a live web page using HTML and CSS

Web Scraping Application

Sometimes, data is just out of reach. Whether it’s a social media website that is guarding its information, a government agency that has poorly organized records, or a cookbook website filled with secret recipes -- data isn’t always accessible by external applications. This is where data scraping comes in. Utilizing Python libraries like Beautiful Soup, you will learn to convert data straight from raw HTML into a queryable and storable form, opening up troves of data for your future applications.

Skills Needed
- Python
- Beautiful Soup
- HTML
- CSS
- MongoDB

Objectives
- Scrape your favorite social media website for otherwise inaccessible data
- Parse through the retrieved information and store it into a MongoDB database
- Create new representations of the data using HTML and CSS
Data Journalism and D3

In this activity, you will be taking on the role of a data visualization specialist working for a major metropolitan newspaper. Your editor wants to run a series of feature stories about the health risks facing particular demographics of the United States. Using the latest information from two government databases and the D3 JavaScript library, you will be creating charts and interactive graphs for this important news article.

Skills Needed
- JavaScript and the D3 Library
- HTML/CSS

Objectives
- Collect data from two government databases
- Store the data within a series of .CSV files
- Create fully interactive graphs that alter with button-clicks
- Place all of your information into a mobile-responsive webpage

Game Studio Analytics

Congratulations! You have landed a job as the Lead Analyst for an independent game company and for your first assignment you have been given the difficult task of analyzing data and creating a report for their latest smash hit release. You will be using the Python Pandas Library and Jupyter Notebook to create demographic and other financial reports.

Skills Needed
- Python
- Jupyter Notebook
- Pandas Library

Objectives
- Use Python and the Pandas library to create a report containing a vast amount of data
- Make the data viewable using Jupyter Notebook
- Find, analyze, and write up descriptions of observable trends in the data

Classifying Yelp Reviews

A Nielsen report concluded that 82% of visitors to Yelp intended to make a purchase, so it’s no surprise that companies take online customer reviews and ratings seriously. In this section of the course, you’ll build an application that can analyze reviews, and tell you through Natural Language Processing whether it’s negative or positive. This means you don’t have to have a human read every review that gets posted and respond accordingly. You can instead have a machine flag negative reviews for you so you can trigger an action like outreach and more.

Skills Needed
- PySpark
- Machine Learning
- Natural Language Processing

Objectives
- Perform Natural Language Processing with PySpark-ML
- Establish a big data processing pipeline to clean and process data
- Train and validate a Naive Bayes machine learning model that can make predictions from customer reviews
## Course Curriculum By Module

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<tr>
<th>Module</th>
<th>Description</th>
<th>What You’ll Learn</th>
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| **Module 1:** Excel Crash Course | Learn to do more with Microsoft Excel! In this module we’ll be covering advanced topics like statistical modelling, forecasting, and prediction; pivot tables, and VBA scripting. You will even learn to model historic stock trends -- and hopefully, learn to beat the market!                                                                                                                                                                                                                                                                                                                                                                               | » Microsoft Excel  
    » VBA Script  
    » Statistics Modeling                                                                                                                  |
| **Module 2:** Python Data Analytics | Gain a strong foothold in one of today’s fundamental programming languages. In the course of this module, you’ll gain deep proficiencies with core Python, data analytic tools like NumPy, Pandas, Matplotlib, and specific libraries for interacting with web data like Requests and BeautifulSoup.                                                                                                                                                                                                                                                                                                      | » Python  
    » APIs  
    » JSON  
    » NumPy  
    » Pandas  
    » Matplotlib  
    » Beautiful Soup  
    » Tweepy                                                                                                                                   |
| **Module 3:** Databases (Weeks 10-12) | Dive deep into the most prolific database languages: SQL and NoSQL. Work with MySQL and MongoDB to organize data into well-structured and easily retrievable data formats. Work on a case study to combine data from different sources into one database.                                                                                                                                                                                                                                                                                                                                                                          | » SQL  
    » NoSQL  
    » MySQL  
    » MongoDB  
    » ETL process                                                                                                                                |
| **Module 4:** Web Visualization | Building visualizations are of little benefit without a way to communicate the message. In this module, you’ll be learning the core technologies of web development (HTML, CSS, and JavaScript) to create new and interactive data visualizations that you can share with everyone on the web!                                                                                                                                                                                                                                                                                                      | » HTML  
    » CSS  
    » JavaScript  
    » AJAX  
    » D3  
    » Leaflet                                                                                                                                     |
| **Module 5:** Advanced Topics | By program’s end, you’ll be immersed in new and in-demand topics like Tableau, Hadoop, and Machine Learning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | » Tableau  
    » Hadoop  
    » Machine Learning                                                                                                                          |
| **Module 6:** Final Project | Bring everything that you have learned in the class altogether to create an impressive data-visualization application with a small team! Get creative and come up with something cool to show off to the whole world!                                                                                                                                                                                                                                                                                                                                                                            | » Dreaming up something fantastic and understanding the bounds of reasonable and achievable                                                               |