

ONLINE

Data Science

BOOTCAMP SYLLABUS



Overview

Data science is a rapidly evolving field and has applications in practically every industry. As ever-increasing volumes of data get generated, stored and used for informing strategic decisions, there is tremendous value in being able to make sense of raw data and gathering meaningful insights from it.

That is what makes data science ubiquitous. Once you understand how to think like a data scientist and work with data using popular tools and techniques, you will be able to apply your learnings in sectors as diverse as marketing, health, finance, technology, sports and public policy.

As a data scientist, you will often analyse large amounts of structured and unstructured data for purposes such as identifying patterns, predictive modelling, problem solving and visual storytelling. In doing so, you will draw upon your knowledge of concepts and techniques from mathematics, statistics and computer science. If you have a curious bent of mind, enjoy problem solving, and aren't afraid of numbers, this may be the career for you!

No prior knowledge of coding is required when taking this bootcamp, as we help you progress from beginner to advanced, becoming job-ready in only six months. As part of the bootcamp, you're taught the fundamentals of programming, statistics and machine learning to enable you to start working as a data scientist.

Going beyond the essentials

You'll learn how to write code that can design and interact with databases to extract data that can solve real-world problems. Advanced-level curriculum includes understanding and applying key machine learning and artificial intelligence concepts to practical uses.

Throughout the bootcamp, you will be guided to develop the skills required to think beyond mere coding or plain analytics. You'll also learn to communicate insights about your data to technical and non-technical stakeholders through visualisation. You will understand some popular applications of machine learning and AI in industry, to guide you on your own projects.

The Process



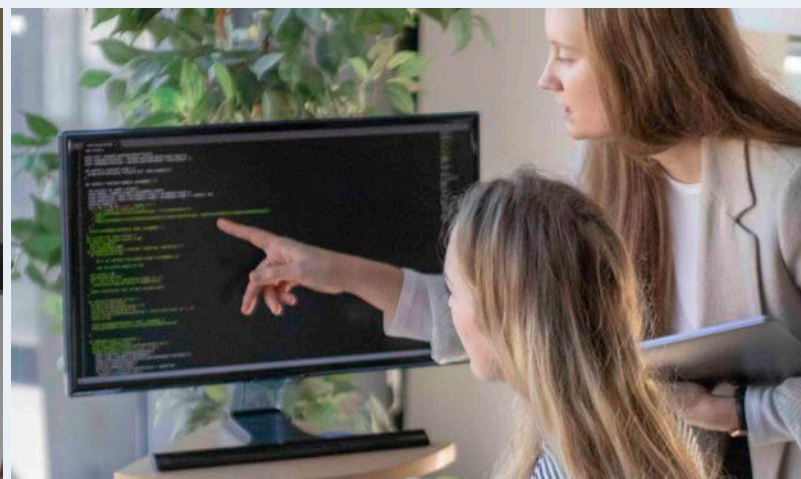


Outcomes of the bootcamp:

- ✓ Write useful code in Python, one of the most popular languages for programming and data science.
- ✓ Collect and clean large amounts and varieties of data and transform it into more usable formats.
- ✓ Develop an understanding of key statistical methods in order to read, analyse and summarise data.
- ✓ Present and communicate insights about your data through visual storytelling and reports.
- ✓ Use analytical techniques such as machine learning, deep learning and text analytics to identify patterns and build predictive models.
- ✓ Look for relationships and patterns in data and spot trends for problem solving.
- ✓ Solve industry-specific problems using data-driven techniques and domain knowledge.

Mentors powered by CoGrammar

Our mentors are expertly trained by CoGrammar, the only company that sources, trains and integrates code reviewers into the lives and bootcamp curriculum of our students. The code review method helps our students become industry-ready for a data science career.



Our 1-on-1 code review centric approach works

Code review enables you to learn to code and work with data science tools the right way, which is a prerequisite for a career in data science. We help you master the deeper aspects of industry-level coding skills to set the foundation for a lucrative career in data science.

Here's why learning through code review is smarter

Don't make the same mistakes as computers

- ✓ Automated code checking is like spell check for computer programs. But you can't write a world-class essay with just good spelling - you need the right tone, facts, grammar, and style. Only human review of your code can help you learn aspects of coding that are analogous to tone and style that will make you truly fluent as a developer or data scientist - automated graders just can't help you learn this!

Get unstuck with professional technical help

- ✓ Most online programming courses have extremely high dropout rates because students get frustrated by generic automated error messages and give up. Through daily and rapid review, your mentor will help you debug your programs and move forward so you never drop out.

Be exposed to the industry standards from day one

- ✓ Developers in the real world have their work assessed by a senior developer through the technique of code review. We're the only bootcamp in the world that exposes our students to this technique from day 1 so you get an unfair advantage in the job market.

We layer a proven 1-on-1 personalised mentorship approach over our code review

Industry experts tailored to your goals

- ✓ You'll be paired with your own dedicated mentor who will tailor your learning experience to your desired career outcomes with 1:1 calls, career coaching, and live chat and email support.

Join a community of career-changers

- ✓ Learn as part of a cohort of students all working towards ultimate career fulfilment. Join group tutorials, community chats and meetups, and peer coaching.

Free of fear of failure

- ✓ 1-on-1 mentoring builds trust with your mentor and lets you progress at your own pace. Establish a safe space to discuss any roadblocks without fear of failure.

Why choose data science as a lucrative career?

Data is only as valuable as the person who is able to read it. Data science is the art of collecting, exploring and processing raw data so that it produces actionable insights for a business. Data scientists provide incredible value in being able to conduct in-depth analyses in order to communicate beneficial solutions to various stakeholders. Because of their inevitable significance to the tech industry, data scientists have garnered high demand, and in turn, high salaries. According to Glassdoor's 2018 list of best jobs in America, Data Scientist takes the #1 spot, with a median base salary of \$110,000, and coming out on top with high job satisfaction ratings.

If you're looking for a career that is both rewarding and lucrative, data science delivers on both. Those who develop data science skills can choose to pursue a variety of career paths, ranging from business analyst to machine learning engineer.

How we get you hired

We're with you every step of your journey, and our support doesn't end when you graduate. Our career services are developed to help you stand out from the crowd, and grab the attention of top employers.



Technical CV and portfolio

Receive technical assistance in getting your CV industry-ready according to accepted best-practice format.



Bootcamp certificate

Walk away with a newly minted certificate as evidence of your skills and expertise in data science.



Interview preparation

Know what to expect when getting ready for that big interview with expert interview preparation from professionals who have been where you are.



Join our hiring network

We work with select hiring partners to place our students in new jobs within six months of graduating. There are also internship placements available with select partners.

Career paths



The Data Analyst

A data analyst processes and interprets data to get actionable insights for a company. Data analysts turn raw data into consumable information, which would inform current business decisions.

Responsibilities include:

- ✓ Developing and implementing data analyses, data collection systems and other strategies that optimize statistical efficiency and quality.
- ✓ Being able to practice proper data visualization.
- ✓ Analyzing results using statistical techniques .
- ✓ Acquiring data from primary or secondary data sources to maintain databases and create dashboards that inform strategic decisions.

Average salaries

A data analyst in the United States can earn an average salary of \$83,878 per year.



The Machine Learning Engineer

A machine learning engineer is the ideal combination of data scientist and software engineer, applying various programming rules and good practices to the code and data provided by data scientists. Machine learning engineers are required to perform A/B tests, build data pipelines and possess in-depth knowledge on powerful technologies, such as SQL.

Responsibilities include:

- ✓ Designing and developing machine learning and deep learning systems.
- ✓ Running machine learning tests and experiments.
- ✓ Implementing appropriate machine learning algorithms.
- ✓ Providing the logging and monitoring pipelines for machine learning tasks.

Average salaries

A machine learning engineer in the United States can earn an average salary of \$114,826 per year.



The Data Scientist

Data scientists are required to understand the challenges of a business and need to provide the best data-driven solutions to resolve them. They are able to find patterns through predictive modeling by combing through and analyzing loads of unstructured data.

Responsibilities include:

- ✓ Data mining using state-of-the-art methods.
- ✓ Enhancing data collection procedures to include information that is relevant for building analytic systems.
- ✓ Creating automated anomaly detection systems and constant tracking of its performance.
- ✓ Building AI tools that automate certain processes within the business based on data findings.

Average salaries

A data scientist in the United States can earn an average salary of \$139,840 per year.

Structure of the bootcamp

This bootcamp helps you progress from learning the basics of programming and data science to becoming a data scientist with a rewarding and satisfying job. Proceed from novice to advanced level, and land the successful career you deserve:

Before you start



Free trial

Learn about programming and data science in general, and how HyperionDev supports you in achieving your career goals. Start programming with Python with an introduction to basic machine learning concepts to decide if a data science career is really for you.

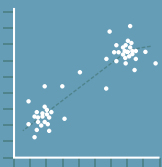
Beginner level



Python for Data Science

Get to grips with the fundamentals of Python, fast emerging as the most popular programming language for data science.

Intermediate level



Data Analytics and Exploration

Learn how to work with databases and popular Python packages to handle a broad set of data analysis problems. You also learn how to create visualizations that can communicate insights about your data.

Advanced level



Machine Learning and AI

Begin with fundamental statistical and machine learning concepts. As you progress through the tasks, build a solid understanding of supervised learning, unsupervised learning and machine learning applications in various industries.

Post graduation



Interview and getting hired

Post-graduation, receive career support and guidance including interview preparation, CV review, direct referral to our hiring partners, and potential internship placement at select hiring partners. Most of our students get hired within six months of graduating.

Breakdown of syllabus

The bootcamp is structured to allow you to start coding as soon as possible. Tasks are designed to:

- 1 Teach you the theory needed to develop your skills.
- 2 Give you the platform to practice implementing your new knowledge by completing practical exercises.

Remember, with HyperionDev, you're never alone. You can contact your mentor for 1:1 support whenever you need help with a task. The code you submit for each task is reviewed by your mentor who is an industry expert, to help improve efficiency and quality of code.

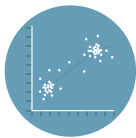


Python for Data Science

Tasks: 20
Capstone Projects: 3

Tasks	Description
1 Thinking logically: Pseudocode and algorithm design	Get introduced to thinking like programmers do. Use pseudocode to structure your thought process and plan your programs before you start to write code. Delve further into algorithm design and representation.
2 Introduction to Python	Learn how to store and interact with the data in our programs using variables.
3 The string data type	Learn how to store and manipulate text using the string data type and built-in functions.
4 Numerical data types	Explore the different types of numbers used in the Python programming language.
5 Control Structures: If else	Learn how to control the order in which statements are executed using the if-else statement.
6 The boolean data type and logical operators	Learn about the boolean data type and how to tell the compiler how to perform specific mathematical, relational or logical operations using operators.
7 Control Structures: Elif Statements	Learn how to check for multiple conditions using elif statements.
8 Control Structures: While & For Loops	Learn how to execute a block of code repeatedly until a given condition returns false, or repeat a section of code a specified number of times.
9 Capstone Project I: Nested loops	Learn how to nest various loops within one another.
10 Defensive programming: Error handling	Discover the different types of errors that might occur in your programs and how to handle them.
11 Working with external data sources: Input	Create smarter programs by learning how to read data from text files.

12	Working with external data sources: Output	Learn how to write data to text files.
13	Beginner data structures: Lists	Discover the most frequently used and versatile collection data type used in Python - the list.
14	Data Structures: Lists & Dictionaries	Learn how to manipulate lists and become acquainted with dictionaries.
15	Functions: Using built-in functions	Learn how to use Python's built-in functions to provide better modularity for your programs and encourage code reuse.
16	Introduction to Object Oriented Programming	Get introduced to principles of object oriented programming to use them later with machine learning libraries.
17	Capstone Project II: Consolidation	Use all the knowledge you have gained throughout this level to create a useful program.
18	Introduction to Natural Language Processing (NLP)	Get acquainted with Natural Language Processing by learning about parts of speech, parsing, and how to install and start using spaCy.
19	Semantic Similarity (NLP)	Learn about sentiment similarity, a popular application of NLP widely used for social media analysis.
20	Capstone Project III: Introductory NLP	Utilise your newly acquired knowledge of sentiment analysis and natural language processing in this capstone project.



Data Analytics & Exploration

Tasks: 21
Capstone Projects: 3

	Tasks	Description
1	Sources of data	Learn how to extract and import data from different sources (JSON, XML, CSV).
2	Introduction to databases	Compare relational, graph and NoSQL databases.
3	Design and build relational database	Design a database by applying normalisation principles. Create a relational database.
4	Working with SQL	Learn how to communicate with your database using SQL and MySQL.
5	SQLite	Get comfortable with SQLite, a self-contained, public domain SQL database engine.
6	Capstone Project I: Databases	Design a system that interacts with a database.
7	Data visualisation I	Understand basic data visualization and how to choose the best form of visualisation based on aspects such as nature of dataset and expectations from the visualisation exercise.

8	Data visualisation II	Dive into more complicated data visualisation. Scatterplot matrix. Network visualization.
9	Data Visualization III	Explore popular data visualization tools such as Tableau.
10	Python packages for Data Science	Get introduced to some of the most popular Python packages like pandas, NumPy, SciPy.
11	Working with datasets	Learn how to import and export data in Python. Start importing and manipulating datasets.
12	Data Visualization IV	Set up Matplotlib and understand how to start loading data from a CSV and NumPy + Panda. Create basic visualisation using Matplotlib, such as pie charts and bar graphs.
13	Data analysis I	Learn about cleaning data, dataframe manipulation, and summarising data.
14	Data analysis II	Understand how to deal with Missing Values and turn categorical variables into quantitative variables. Explore data normalisation.
15	Exploratory Data Analysis	Learn about descriptive statistics and concepts such as GroupBy, Correlation, Analysis of Variance ANOVA.
16	Capstone Project II: Data Analysis	Build an analysis report based on a dataset.
17	Data visualisation V	Create advanced visualization using Matplotlib, including scatter-plots, time-series plotting, area charts, and 3D plots.
18	Capstone Project III: Data Visualization	Put your knowledge of data analytics and visualization to the test in this comprehensive task.
19	Introduction to version control and Git	Explore the Git version control system and the GitHub collaboration platform.
20	Git basics	Dive into using Git and discover how to set up a repository, use common Git commands, commit a modified file, view your project's history and branch.
21	Build your brand I	Use GitHub to start building a portfolio of work that you can share with others to showcase your skills.



Machine Learning and AI

Tasks: 22
Capstone Projects: 3

	Tasks	Description
1	Build your Brand II	Create or update your LinkedIn profile to connect with a network of professionals and let people know about your skills.
2	Introduction to Machine Learning	Explore what a Data Scientist does. Get introduced to supervised and unsupervised machine learning.
3	Supervised learning I: Simple Linear Regression	Learn what linear regression is and when to apply it.
4	Supervised learning II: Multiple Linear Regression	Explore more concepts such as multiple linear regression, and Training vs. Test Set.
5	Supervised learning III: Logistic Regression	Introduces the notion of classification, and the application of logistic regression to binary classification.
6	Supervised learning IV: Decision Trees I	Learn about regression trees and classification trees that are essential concepts to supervised learning.
7	Supervised learning V: Decision Trees II	Dive deeper into supervised learning by learning about bagging, random forests, and boosting.
8	Capstone Project I: Image Processing	Build an image recognition classifier which accurately determines the house number displayed in images from Google Street View.
9	Build Your Brand III	Join the Hyperion Connect community to make yourself visible to Hyperion hiring partners.
10	Unsupervised Learning II: Clustering I	Understand how to work on clustering algorithms such as k-means, a commonly used unsupervised learning algorithm.
11	Unsupervised Learning II: Clustering II	Explore more unsupervised learning algorithms such as hierarchical clustering.
12	Unsupervised Learning III: PCA	Add to your knowledge of unsupervised learning by studying dimensionality reduction.
13	Capstone Project II: Unsupervised Machine Learning	Test your knowledge of unsupervised machine learning in this challenging task.
14	Neural Networks I: Introduction	Become familiar with the fundamental concepts and terminology used in neural networks. Understand backpropagation and learn how to validate your models.
15	Neural Networks II: Training Neural Networks	Learn different techniques to train neural networks using backpropagation.

16	Neural Networks III: CNNs, Yelp reviews Practical	Get introduced to Convolutional Neural Networks with sample projects.
17	Neural Networks IV: Recurrent Neural Networks: Sample Project	Delve into the applications of Recurrent Neural Networks with a simple project to follow and work on.
18	Reinforcement Learning: Practical example of AlphaGo	Describe the concept of reinforcement learning including Markov Decision Processes, Q-Learning.
19	Machine Learning in the Industry	Learn about industry-relevant applications of machine learning in finance and healthcare.
20	Capstone Project III: Consolidated Machine Learning	Challenge your knowledge of machine learning gained throughout this bootcamp in this final capstone project.
21	Build your brand IV	Get some pointers for a successful technical interview and connect with your Hyperion Connect team to arrange a mock interview.
22	Build your brand V	Make your mark by ensuring that all components of your online presence related to your professional brand are finalised.