

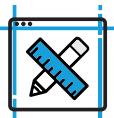


Data Science Bootcamp

Curriculum Package

The Lighthouse Labs Bootcamp Experience

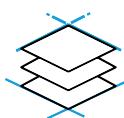
At Lighthouse Labs, we understand being a data scientist requires so much more than just learning how to read datasets, use and navigate popular data science tools, libraries, environments and workflows. Over 12 challenging weeks, we'll provide you with the skills, knowledge, and confidence to launch a career in data science. From SQL to Python to Machine Learning and beyond, each module of our immersive, industry-driven curriculum is designed to equip you with a strong foundation of skills to help you succeed and grow as a data scientist. With the support of a diverse community of mentors and peers, our industry-driven bootcamp programs provide you with the skills and support to kick-start your career pathway.



Industry-Driven Education



Learn in Community
On-Demand Mentorship



Portfolio of fully functioning data projects



Personalized Learning:
Smaller Classes and Ample Stretch Goals



Daily assessment and regular feedback

Your Bootcamp Journey With Lighthouse Labs Will Help You To:

- use popular data science tools, libraries, environments and workflows
- apply various data wrangling techniques with a number of data types and representations
- select the most effective data visualization method to tell a story from an existing dataset
- recognize the fundamental concepts and applications of machine learning
- implement algorithms to solve common machine learning problems
- compare the opportunities and limitations of deep learning architectures
- deploy your own machine learning model and develop data engineering pipelines
- present data science findings to both technical and non-technical audiences
- work independently and collaboratively on Machine Learning projects in any sector
- progress towards a career as a Data Scientist, Engineer, Analyst, or other data-driven role

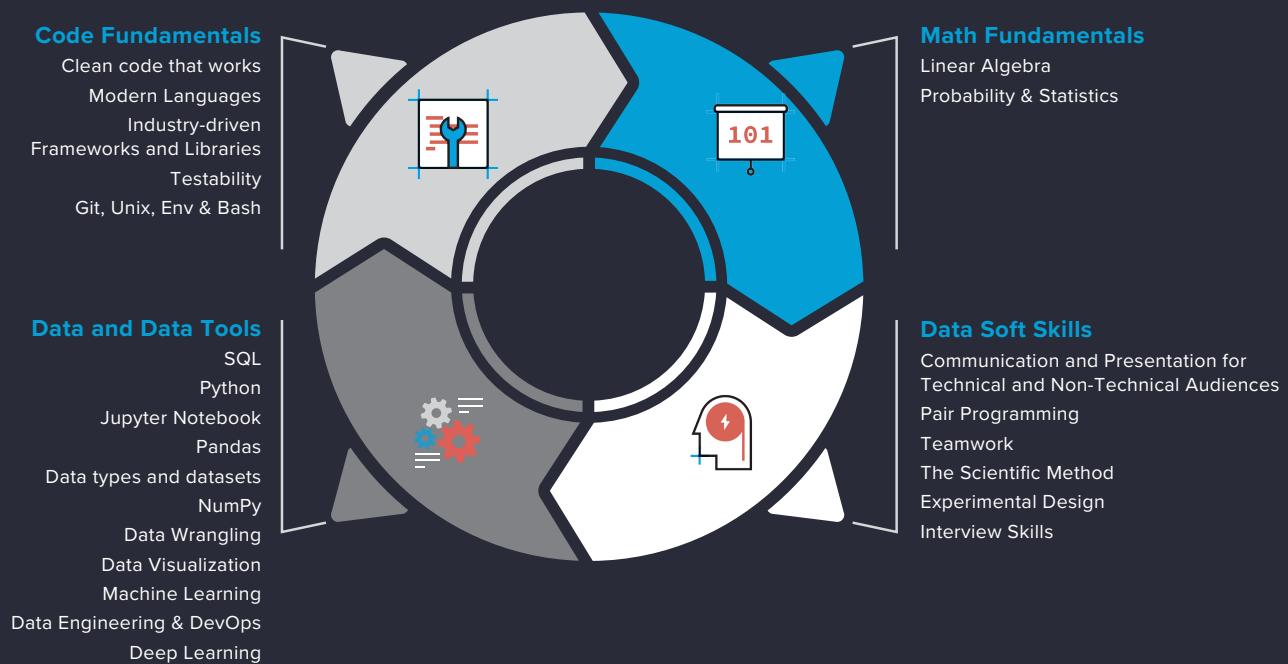


Our annual Student Outcomes Report is proof of our reputation of strong outcomes for our students - a record **93% employment rate within 120 days** after graduation for our Web Development Bootcamp students across Canada. This tried-and-true approach will be used to bring the same success to our Data Bootcamp students.

We Teach For Mastery

We've built a carefully crafted curriculum, informed by industry professionals, leading experts in data science, and technology experts who know what you need to succeed as a data science professional. Focused around four pillars of knowledge and skills essential to data science, our curriculum is complemented by tried-and-true reinforcement strategies designed to help you build key skills to succeed in an ever-changing landscape.

Our Four Pillars



Our Education Approach

Blended Learning Content

In addition to exercises and quizzes, you'll gain access to a curated library of learning content in a variety of mediums so you can explore concepts on-demand in the format of your choice.

Watch-Try-Do

When it comes to learning something new, we're with you step by step. First we'll show you how it's done, then we'll guide you through your first attempt and help you gain confidence in this new skill.

Research, Reflect and Present

The data science industry and roles are constantly evolving. Data scientists need the ability to step back, research, and navigate evolving data science tools, libraries, and workflows to achieve business needs. We help you build this skill through short weekly reflections and presentation sessions, where we challenge you to tailor your presentations for various audiences. These reflections form a technical portfolio you can use beyond graduation to demonstrate your ample experience presenting data science insights.

Tech Interviews & Katas

Prepare for the computer science component of technical interviews by completing weekly kata training challenges, and a series of mock technical interviews with mentors.

Building and Enhancing Your Portfolio

Core Curriculum Mini-Projects

Your ability to quickly understand a need, contextualize data and present it in a meaningful way is an important factor on your value as a data scientist. That's why you'll dedicate more than seventy-five per cent of your time in the program to experimenting and building data science solutions. By the time you graduate, you'll have a portfolio of various data science explorations to show potential employers.

Midterm & Final Projects

In Week 6 you'll team up with your peers for your first major project - the Midterm. You and your team will have the opportunity to get creative and put your skills to work as you replicate data science explorations within real world contexts.

In the last two weeks of Bootcamp, it's your time to shine! The final project allows your team to use your collective creativity and coding acumen to develop a hypothesis and build a data science exploration from the ground up.

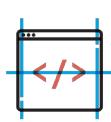
Our Tech Stack

We cover a myriad of industry-relevant technologies vetted by our community of employers, subject matter experts, and members of the broader tech community. Given the importance of a lifelong learning mindset in a changing industry and landscape, learning key data science languages and tools allows you to be prepared for your first role while equipping you to continue learning throughout your career.



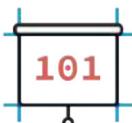
Data Science Environment

Set up a Data Science Environment on your own machine using Anaconda, Git, and Virtual Environments.



Coding

Learn the basics of programming and computer science, including Python, Jupyter Notebook, and VSCode.



Math Foundations

Dive into the basics of Probability Theory, Statistics, and Linear Algebra using NumPy and Statsmodels.



Data Wrangling

Master the art of data manipulation and preparation for Data Science using Pandas, APIs, and Regex.



Databases

Discover relational and non-relational databases such as SQL, NoSQL (MongoDB, Redshift), SQLite, Postgres, SQLAlchemy, Turbodbc, and PyODBC.



Visualization

Learn the principles of graphical integrity and the guidelines for visualization context and guidelines with tools like Matplotlib, Seaborn, Plotly, Mpl_toolkits, Geopandas, and Ipywidgets.



Machine Learning

Using sklearn, Spacy, NLTK, Gensim, Tensorflow and Keras, you'll dig into the elements of Machine Learning like Supervised Learning, Unsupervised Learning, Deep Learning, NLP, Time Series, and Recruiters.



Development Process

Master the development process, using AWS, Flash, Docker, and Spark to move through Design, Experimentation (Prototyping), Production code, and Deployment.

Curriculum Breakdown



Data Foundations (38 hours)

- Fundamentals
 - Development environment
 - Git
 - Unix
 - Bash
 - Assertions & Unit Testing
- Python Fundamentals
 - Functions
 - Loops
 - Conditionals
 - Importing modules
 - Dictionaries
 - Lists
 - Tuples
 - Numpy arrays
- Probability and Statistics



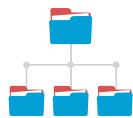
Data Wrangling (40 hours)

- Pandas
- Data types
 - HTML
 - Text
 - XML
 - JSON
 - Images
- Mini project
- SQL
- ETL
- APIs



Data Visualization (30 hours)

- Concepts
- Overview of Tools
- DataViz in Python
 - Matplotlib
 - Seaborn
 - Plotly
- Complex Plots
 - Scatter plots
 - Density plots
 - 3D plots
 - Contour plots
 - Marginal distribution plots
 - Pairs plots



Machine Learning (82 hours)

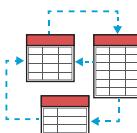
- Data preparation
- Feature engineering
- Sampling and dimensionality reduction
- Introduction to Machine Learning Modeling
- Optimization with gradient descent:
 - Gradient descent
 - Stochastic gradient descent
- Training and evaluation
- Modeling techniques
 - Supervised
 - Logistic regression
 - Decision trees
 - Random Forests
 - Boosting
 - Support Vector Machines
 - Unsupervised:
 - Hard clustering methods: K-means, mediods, modes
 - Hierarchical methods
 - Soft (probabilistic) clustering methods: GMM, HDBSCAN



Midterm Project (54 hours)

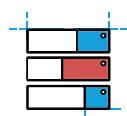
You will get an opportunity to practice your skills from kick-off to demo with an end-to-end group project.

- Problem understanding
- Design of the solution
- Combination of data from different sources
- Prototyping
- Evaluation
- Presentation of the results



Data Engineering & DevOps (40 hours)

- Pipelines
- Deployment of Machine Learning models
- SPARK
- Docker & Containerization
- Flask
- AWS



Deep Learning (30 hours)

- Introduction to Neural networks
- Back-propagation with gradient descent
- Architecture
 - FNN
 - RNN (LSTM, GRU)
 - CNN
- Tensorflow Core 2.0 (Keras API)



Applications of Machine Learning (80 hours)

- Recommender engines:
 - Matrix factorization
 - Collaborative filtering
 - Collaborative filtering with DL
- NLP:
 - Applying FNN, RNN, and CNN
 - Word2Vec, word/sentence embeddings, cosine distance
 - Topic modelling
 - TSNE/UMAP
 - Sentiment analysis
- Time Series Analysis
- A brief overview of advanced applications:
 - Reinforcement learning
 - DL with attention
 - Online learning
 - Graphical models



Final Project

It's time to put all your skills to the test with this final group project.

- Problem understanding
- Design of the solution
- Combination of data from different sources
- Prototyping
- Evaluation
- Deployment
- Presentation of the results

Discover Your Career Path

We get it - the world of work is changing. That's why we've packed this course full of the skills you need to plot a career path that helps you move from where you are now to where you want to be, and our Career Services team will help you get there.

We're invested in your success, and preparing you with everything you need for your next career - or the one you'll want five years from now.

Here's a peek at the potential career options available to future you:

Your Current Role

Whether you're just starting in the working world or you have some experience with math, coding, and data, this program is made for you.

Senior Software Developer

Computer Science (post-grad)

Junior Software Developer

Data Analyst

Math / STEM (post-grad)



Your Future Role

By the end of this bootcamp, you'll be equipped to walk into one of these roles:

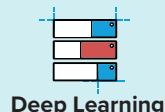
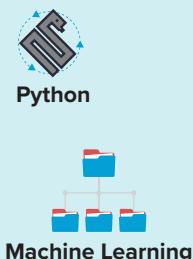
Machine Learning Engineer

DataOps Engineer

Data Science Generalist

Data Analyst

Senior Data Analyst



Launch Your Career

Our dedicated Career Services team is here to help you jump from the classroom into the real world as smoothly as possible.



Career Coaching

Plan your career strategy with our full-time recruitment experts

Portfolio and Resume Reviews

Detailed, personalized feedback and tips to elevate your resume and portfolio

Interview Training

Interview workshops and mock technical interviews throughout the program for job preparation.

Employer Events

Demo Days and Employer Speed Interviewing events help employers get to know you as you showcase your skills

Our Career Services team maintains relationships with an ever-growing network of industry contacts, keeping their finger on the pulse of what employers are looking for in this fast-paced industry. We hustle from day one, and we expect you to do the same. Finding a job is no easy task, but whether you're pivoting from a different role or looking for your first position ever, we'll be there to support you every step of the way.

Our support doesn't end at graduation - it's yours for life.

Life After Bootcamp



Community

As alumni, you remain an active part of our community. We host Demo Days, meetups, learn-to-code initiatives, hackathons, guest speakers, and alumni events on the regular.

You also gain access to our alumni Slack group, where you can organize educational and social events, and hear about recurring alumni events.

Continuous Learning

As a Lighthouse Labs alum, you will always have access to our curriculum and its future iterations - yes, until the end of time.

Your access to our learning platform never expires, and you'll benefit from ongoing lecture notes and learning resources as we continue to iterate our world-class curriculum.

READY TO CONQUER YOUR DATA?

Apply Now



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