

# DATA ANALYTICS

26-WEEK VIRTUAL BOOTCAMP  
COURSE GUIDE

"Time pushes  
everything forward. No  
stunning success and no  
sorrowful failure lasts  
forever. Absolutely  
everything comes to  
pass"

- Rapelang Rabana

South African Entrepreneur and Technologist

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# 1. WHAT YOU SHOULD KNOW ABOUT US

CodeOp is the first international coding school for women and the TGNC (trans, and gender non-conforming) Community. We channel all of our resources into encouraging, supporting and equipping people from these minority groups with the right skills to become technical professionals in their field.

We offer three courses led by senior-level professionals to support our students at various stages of their tech journey:

1. An 11-week full-time or 6-month part-time course to transition into tech. Students **develop full-stack applications** from scratch while also undergoing extensive career preparation. Offered in-person or online.
2. An 11-week full-time or 6-month part-time course for those with a statistical or technical background. Students gain hands-on experience with the various stages of the **data analytics** pipeline from an industry perspective. Offered in-person or online.
3. A 60-hour part-time, live-online course designed by a team of Silicon Valley PMs from Facebook and Lyft; and for existing **product managers** who want to upskill, as well as anyone looking to break into tech or change their current role.

# WHAT YOU SHOULD KNOW ABOUT OUR DATA ANALYTICS COURSE

Data Analysis is the process of inspecting, cleansing, transforming and modelling data, using database querying, visualization, statistical analysis and machine learning to discover useful information, to inform conclusions and to support decision-making. These methods and tools are used in different business, science, and social science domains, to answer questions, test hypotheses or disprove theories, which is why it has become such an in-demand knowledge.

During this course you will learn the different steps of the data analysis pipeline, from ingestion to modelling to the communicating insights.

The data types covered in this course will include not only relational data (e.g.: data tables), but also more complex data types such as text and geospatial information. The course will be hands-on, "learn by doing," and it will follow an incremental approach building on the knowledge of previous modules.

You'll spend the first few weeks getting acquainted with some key technologies and concepts needed to build a solid technical foundation. Then we will delve into basic statistics and applied machine learning which will feed into our more advanced data analytics module. In the latter part of the course students will build end-to-end data analytics projects individually as well as in groups.

By the end of the program, you will be able to identify which sort of questions can be solved with data analytics, and how to solve them, by leveraging the right tool, or combination of tools.

# 2. WHY YOU SHOULD LEARN

## Reason #1: Because you want to!

First things first, we think this is the main reason to learn anything, and the biggest motivator in getting to wherever you want to go next. As with many new skills, data analysis has a steep learning curve. It will require patience and open-mindedness so that even when you're finding it frustrating, your drive to learn will make it that much easier to focus and power through.

## Reason #3: Because it teaches you a new system of thinking

Learning to analyze data will give you more than technical knowledge—it also gives you a new outlook and way to approach your work. Problems become opportunities—you'll learn skills that provide a logical way of thinking, allowing you to uncover insights from data and thereby inform decision making, test hypotheses and answer interesting questions.

## Reason #2: Because you'll have better opportunities

New and exciting possibilities open up once you add 'coding' to your professional toolbox. In general, it's an excellent way to advance your skill set in a short amount of time that can have a positive impact on your future. There's no shortage of opportunities for people who know how to code.

## Reason #4: Because you're driven to make a change

If you want to be involved in an industry that's at the forefront of impacting the world, learning how to code and analyze data is a guaranteed route in. And with diversity comes increased change. Tech is driving societal change however, the people involved in these fields don't truly reflect the make-up of our current society. We need new, different voices in this area, and your learning how to code can ensure you become one of them.

# 3. WHAT YOU'LL LEARN

Our three-module system guarantees that our graduates are industry-ready.

**Module 1** is focused on the fundamentals. In addition to reviewing the foundations, you'll learn to develop problem-solving abilities and enhance concept retention. We teach through scaffolded lectures and activities, live activity reviews and monthly assessments.

**Module 2** is focused on projects. We don't have you work on just one portfolio project, we diversify your project work from datasets to the problems to working individually and on teams.

**Module 3** is focused on preparing you to enter the tech industry. We teach through data challenges, technical improvisations, pitch-coaching and mock HR and technical interviews.

## Week 01

### Overview of Data Analytics/ Dev Environment

You'll set up your development environment and you'll learn what Data Analysis is, the lifecycle of Data Analysis projects and which methods and tools are used throughout it.

Topics: shell, Git, GitHub, VS Studio code, Remote Servers

## Week 02-04

### Introduction to Programming

You'll learn the foundations of programming using the Python language.

Topics: Ubuntu, Python v3, Anaconda.

## Week 05-06

### Programming for Data Analysis

You'll learn how to use Python libraries and Jupyter notebooks.

Topics: Pandas, NumPy, Pytorch, Matplotlib

## Week 07-08

### Infrastructure and SQL

You'll learn how to extend the development infrastructure using cloud providers, interact with relational databases using Python and how to use Docker.

Topics: Docker, AWS, SQL, BigQuery, Azure

## Week 09

### Statistics

You'll learn basic statistics concepts such as probabilities, central tendency measures, charts and graphs.

Topics: statistical inference, descriptive analytics, predictive analytics, Jupyter Notebooks

## **Week 10-14**

### **Machine Learning**

You'll learn the differences between supervised and unsupervised machine learning methods, and the different families of algorithms within each group.

Topics: R, classification, regression, clustering

## **Week 15-20**

### **Advanced Data Analysis Topics**

You'll learn more advanced methods of data analysis which deal with data types such as text, geospatial data, time-series and networks.

Topics: Time-Series, Networks, Text Analysis, Visualization

## **Week 21-24**

### **Data Analytics Project**

You'll have the opportunity to do an individual and a collaborative data analytics project and apply the knowledge gained in the previous modules to a real use case.

Topics: collaboration, advanced Github techniques, end-to-end data analytics pipeline

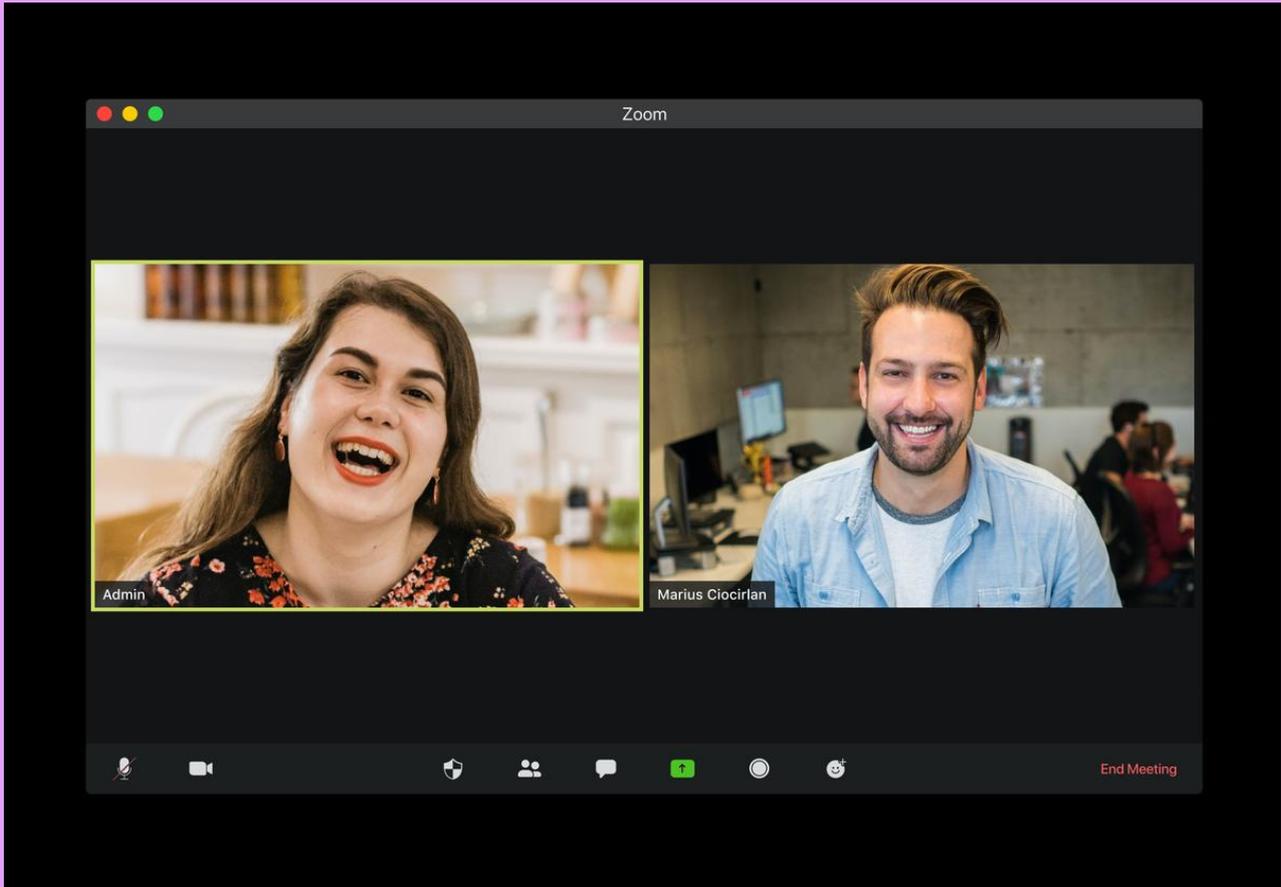
## **Week 25-26**

### **Career Prep**

By these last weeks of the course, you will be prepared to enter the job market with a finished resume and strategies for interviews.

Topics: resume development, online portfolio, technical challenges, whiteboarding, interview strategies.

## 4. HOW YOU'LL LEARN



"The instructor is always available and he has this way of commenting on our solutions that really opens up a totally new way of thinking!"

Neha Sharma, Data Analytics Student

# THEORETICAL PHASE

## Weeks 1-20

### Lectures (~1 hour, daily)

Lecture slides focus on topics (e.g. “SQL”, “Data Visualization”, “Machine Learning”, etc.) and are shared with students. These slides are concise for two reasons:

- To encourage the lecture to be as interactive as possible, and
- To encourage students to use the Internet as their primary source for information. (For more information, review “Information Literacy” in “Scaffolding Strategies” of the How We Teach section of this document.)

### Activities (~1.5 hour, daily)

Activities consist of exercises or tasks that are related to the lecture content and reinforce what was covered in class. They allow students to get some hands-on learning and to practice in their own time.

### Live Activity Review (~30 minutes, daily)

The instructor goes over ways in which the activity could be approached explaining their thinking and the steps they would take to complete a task. Time is set aside to answer any student questions and go over different approaches that students took.

### Assessment (2.5 hours, Saturdays)

The purpose of the assessment is to target student problem solving abilities and concept retention, as well as weaknesses in teaching and the curriculum. Students are assigned supplementary work based on their results. This can involve redoing past assignments, doing a new assignment, and fixing / finishing their assessment, etc.

### Mini Industry Lectures (1-2 hours)

Students participate in lectures from senior-level professionals from within the local tech community (these may be broader than data analytics– e.g. Data Engineering, FOSS, NLP, Agile methodologies, Product Development)

# PRACTICAL PHASE

Weeks 21-24

## One-on-One Meetings (daily)

The instructor meets regularly with students throughout the project phase, helping them prioritize tasks, doing project reviews, and offering technical suggestions.

## Coaching Session & Guest Lectures (Flexible)

Students meet with their career coach and participate in lectures from senior-level professionals from within the local tech community (these may be broader than data analytics- e.g. Data Engineering, FOSS, NLP, Agile methodologies, Product Development, etc).

## Projects (daily)

There are two main projects students work on. These are designed to show that students can receive a data set and carry out all the steps in the data analysis pipeline from ingestion to modelling and the communication of insights.

- **Project 1 Individual:** Students choose a problem to tackle using the knowledge gathered in the previous modules. They cover all the stages of the Data Analytics lifecycle from inspecting, cleansing and transforming the data to modelling it and finally in the end drawing conclusions and sharing their insights.
- **Project 2 Group:** Students work in small groups to carry out an end-to-end data analytics project. Learning how to effectively use advanced GitHub techniques and learning how to manage the social dynamics of teamwork.

# CAREER PREP PHASE

## Week 25-26

### **Data Challenges (1 hour, daily)**

Students are given a data challenge that they need to complete within a specified period of time. Challenges usually include a data set and a problem and students are tasked with explaining how the data can be pre-processed, modelled and how they could gather insights in the end. These challenges are an opportunity for students to practice tackling different kinds of problems and explain their thinking clearly- a skill which will be necessary in order to succeed in future interviews.

### **Activities (~4 hours, daily)**

Students undertake tasks like resume writing, personal story development, online presence polishing, mock HR and technical interviews, as well as technical trivia practice.

## 5. HOW WE TEACH



"There are decades of research about how instructional strategies such as scaffolding, modeling, and reflection are important in comprehending new concepts. So we feel it is extremely important to incorporate them into our curriculum."

KRISTA MORODER,  
CODEOP CURRICULUM  
DEVELOPER

## HOW WE TEACH

We're serious about giving you access not only to the best resources and instructors, but also the best teaching practices that will better help you comprehend new concepts.

The instructional design and curriculum for the Data Analytics course was built in collaboration with built by a collection of folks working in both industry and academia. Some of the primary pedagogical choices are detailed in depth below.

### **Scaffolding Strategies**

Students entering the workforce will be expected to know and understand how to find artifacts, resources, and environments in which they can gain new knowledge as the tools and technologies they use continue to evolve. Because of this, CodeOp's model doesn't just include scaffolding of content, but scaffolding of information literacy skills: being able to identify, locate, evaluate, and effectively use information to solve a problem.

### **Formative Feedback Strategies**

The importance of ongoing, targeted feedback for student learning can't be understated. Our model incorporates this feedback in multiple ways: Regular Assessments, Daily Solution Lectures, and Activity Reviews.

### **Mentoring Strategies**

Several studies have focused exclusively on women in mentoring relationships. According to "Women and Mentoring: A Review and Research Agenda", women who had one or more mentors reported greater job success and job satisfaction. Because of this, CodeOp has created a deliberate focus on providing mentorship as part of the educational experience, including Career Coach Sessions and Guest Lectures from Senior Professionals

### **Individual Completion of Activities**

A learner-centered classroom that uses formative feedback and response to intervention strategies is considered the most impactful teaching strategy on student learning. CodeOp differentiates itself from other programming courses in this way: the classes are small, the focus is on the learner, and the interventions are flexible to the context of the current learners in the classroom.

## 6. ONLINE LEARNING

Due to the global Covid-19 situation, the CodeOp Kuala Lumpur campus team at TechSprint has had to make two big decisions in order to keep our team and students safe.



### Our In-Person Bootcamps

We have moved all our current and upcoming courses to a remote learning format. Our in-person bootcamps will remain fully remote until further notice.



### Extending Our Online Bootcamps

Our global team is working hard to make our online bootcamps even more accessible to women around the world, who have been disproportionately affected by Covid-19.

## WHAT DOES A DIGITAL LEARNING EXPERIENCE LOOK LIKE?

### Synchronous Learning

Zoom is our primary video calling tool. Breakout rooms, remote control access & live polls allow us to interact, teach and connect with each other remotely.

### Live Support

Throughout the day the instructors are available in order to give you a helping hand during your coding journey.

### Virtual Pair- & Mob-Coding

Live Share by Visual Studio Code enables students to share their code with an instructor dynamically so they can take part in solving the activities in class.

### Primary Mode of Communication

Slack is our main communication tool. We have topical channels and share course news and materials through it (sometimes a couple memes may slip in as well).

### Asynchronous Learning

All lectures and activity reviews are recorded. This means you can always go back and review some material in your own time if you like.

### Global Community Access

Our community alumni Slack workspace is another virtual community to solicit support for technical and non-technical related issues.

There are only a limited number of things you can do in such a short amount of time to broaden your mind and impact change. Let learning new technology should be one of them!



**APPLY NOW!**

Contact us via email at  
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