



# DATA ENGINEERING

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# Professional Foundations Programme

(your first 3 months)

## What is Professional Foundations?

Professional Foundations is a foundational programme that helps young professionals develop the essential skills needed to excel in their careers.

Over 3 months, learners engage in a programme designed around practical skills and knowledge, specifically tailored to the modern tech workplace. Through a mix of individual projects, team-based challenges, and real-world applications, this programme builds a solid foundation for professional success.

## Why is this Programme Important?

In today's job market, technical skills alone are not enough for a successful career. Employers seek well-rounded professionals who possess both technical know-how and soft skills—like communication, problem-solving, and leadership.

The Professional Foundations programme bridges this gap, empowering learners to navigate complex work environments with competence and confidence. This programme provides a complete toolkit for building the vital skills professionals need to succeed in a career in any industry.

## Career Readiness

Learners gain critical professional skills that help them stand out in the workforce and succeed in tech-focused roles.

## Collaborative Learning

Learners work in squads, encouraging peer-to-peer learning, teamwork, and a culture of continuous growth. This experience also helps build a strong professional network that will help learners grow their future careers.

## Practical Application

The programme features hands-on exercises and deliverables that allow learners to immediately apply their newly acquired skills, making learning both engaging and relevant to the real world.

## Key Components of the Programme

Professional Foundations emphasises 8 key Meta-Skills across Leadership, Analysis, and Execution—essential skill sets for thriving in today's workplace.

**Leading Self**

**Leading Others**

**Communicating for Impact**

**Quantitative Reasoning**

**Entrepreneurial Thinking**

**Critical Thinking**

**Managing Complex Tasks**

**Tech Skills**

# 7 Months (20–30 hrs per week)

## What is Data Engineering?

The ALX Data Engineering programme is designed to equip individuals with the knowledge, skills, and experience necessary to become proficient data engineers. It focuses on practical, real-world applications, covering essential tools and technologies for building data pipelines, managing big data, and supporting data-driven decision-making in organisations. The programme emphasises modern, tool-agnostic skills relevant to today's big tech industry.

## Why Data Engineering?

Data engineering is the backbone of today's digital world—empowering organisations to become truly data-driven by building the robust infrastructure needed to harness the vast volumes of big data stored in the cloud, ensuring it is clean, accessible, and usable, while fueling analytics, AI, and business intelligence systems that drive high-quality, strategic decision-making across industries.

## How you'll learn

We believe the best way to learn is by doing. Our approach focuses on practical, project-based learning inspired by the work of real-world data engineers at leading tech companies. You'll tackle real problems, use modern tools, and develop a portfolio of work that showcases your ability to solve complex data challenges.

- **Professional Foundations** – Build confidence with productivity tools, critical thinking, and digital literacy.
- **Data Analytics** – Master spreadsheets, SQL, and data storytelling.
- **Python Programming** – Learn one of the most widely used languages in data and tech.
- **Data Engineering Specialisation** – Dive deep into big data, distributed systems, and production-ready pipelines.

## Why Choose Us?

### Professional Foundations

Before starting the Data Engineering programme, learners complete our 3-month foundational training, where they acquire vital skills such as self-awareness, teamwork, communication, and critical thinking—essential for success in tech.

### Industry-Relevant Skills

Learn directly from experts and real-world projects used in big tech.

### Project Portfolio

Showcase your skills to future employers with a portfolio of practical work.

### Career Confidence

Step into roles that require real data engineering expertise—backed by a modern, comprehensive curriculum.

### Community & Support

Join a growing network of ALX learners, mentors, and professionals across the continent and beyond.

## Tools Learners Get to Use



Python



Docker



Apache  
Airflow



Apache  
Spark



Apache  
Kafka



PostgreSQL

## 7-Month

Programme

## 100%

Digital (Online)  
Learning  
programme

## 20–30 hrs

Per Week

# Specialisation Breakdown

## Each week, you will be expected to:

- **In the first 3 weeks**, you will be introduced to the platform and the overall scope of what data engineers do. Expect to cover a lot of theory with minimal practical work.
- **In the second 3 weeks**, you will explore the full data engineering lifecycle. Be prepared to see the big picture, work with a range of tools, and begin some hands-on practice.
- **In the next 3 weeks**, you will take a deep dive into Docker. Be ready to work directly with modern development architecture.
- **In the following 3 weeks**, you will focus on Airflow. Building on your Docker experience, you'll dive into this powerful tool and engage in hands-on practical work.
- **In the final 3 weeks**, you will work with Spark. This phase builds on your Docker and Airflow skills, and you'll apply your knowledge through practical, real-world tasks.

## Content Breakdown

| Phase                           | Module Name                                                                                                                                   |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Professional Foundations        | Professional Foundations                                                                                                                      |
| Data Analytics                  | <ul style="list-style-type: none"><li>• Explore 101</li><li>• Preparing data</li><li>• Querying data</li><li>• Visualizing data</li></ul>     |
| Python                          | Python                                                                                                                                        |
| Data Engineering Specialisation | <ul style="list-style-type: none"><li>• DE 101</li><li>• Big Data Fundamentals</li><li>• Docker</li><li>• Airflow</li><li>• PySpark</li></ul> |
| AWS                             | AWS Cloud Practitioner                                                                                                                        |