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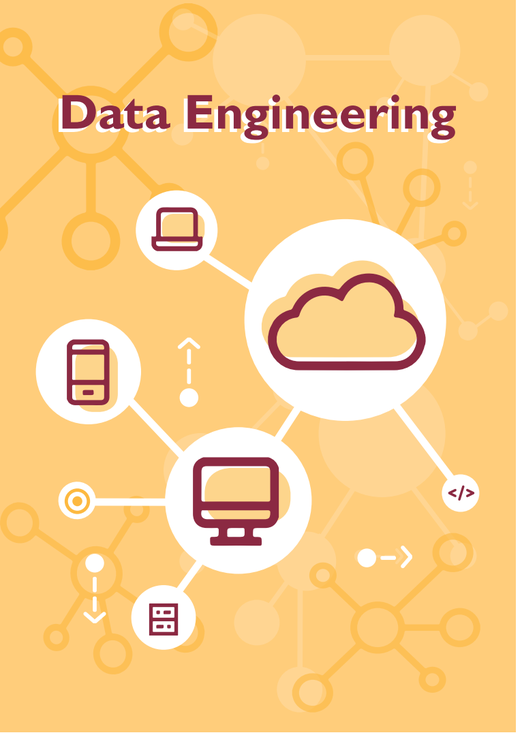
# Data Engineering



## Why Data Engineering?

Do you want to influence the way a company thinks, or acts? Or how the medical field manages an illness? Or help to catch international fraudsters scamming banking systems? If you do, then you'll need the right info at hand to help make your decisions. Based on facts. Based on data. And as there's so much data being generated every hour, every day, how do we know which data to use? How do we get the data, how do we make sure it's the right data, and then how do we use the data?

We need YOU to work that out! Come and study Data Engineering at Stellenbosch University and help to figure out answers to tough questions in today's economy, society, and daily life.

## What is Data Engineering?

It is looking at the masses of data that is being saved in a system, cleaning it up and structuring the data so you're only working with the important stuff. This includes developing systems to generate the data itself, then creating the tools used for analysing and modelling the data to find patterns that indicate trends. Identifying these trends and understanding the cause of the actions will lead to a better understanding of complex systems, and being able to come up with a solution. That's what Data Engineering is all about.

## What do Data Engineers actually do?

Data engineers must understand what the company or organisation needs to find out from the data. Then the data engineer needs to make the data available for analysis. Where is it coming from? How is it stored? Who can access it? (And who shouldn't be accessing it?)

More technically: Data engineers develop and maintain an organisation's data pipeline systems, including creating devices and networks using smart devices, cell phone apps, and the internet that will generate data, and then collecting, storing, synchronising, transforming, cleaning data, and making sure the data is used ethically.

You'll need to develop algorithms (instructions for computer software systems) to help make raw data more useful, by transforming the data into a more usable format that can be mined and modelled.

To understand the system by looking at the data, you'll create and use tools that include Artificial Intelligence systems and Machine Learning to mine important information from the data. Once you have understood what the data patterns mean, you'll need to communicate the results to different audiences.

## What's the difference between Data Engineering and Data Science?

This is a grey area as data science is such a broad term. However, as a very generalist definition, a data engineer is the person that creates systems to collect or generate the data, and the algorithms and tools that make that data available to data scientists. A data scientist is someone who analyses complex and massive data sets.

## What will my degree be called?

BEng (Electrical and Electronic) Data Engineering.

## What skills should I have?

Strong technical skills, including a deep knowledge of database design and multiple programming languages, as well as machine learning algorithms and data analytics techniques. Excellent communication skills, to understand the problem properly and then present your findings in a way that is easily understood by the audience.

## What subjects will I study?

Engineering, Mathematics, Statistics, Artificial Intelligence and Computer Science.

## Do I need to know how to code?

Yip! But we'll teach you. It helps if you did Information Technology (IT) at school. During your undergraduate years you'll study the coding languages used to develop software. Doing IT at school is not a prerequisite for doing Data Engineering.

## How do I apply?

Apply for BEng (Electrical and Electronic), and after acceptance, you'll have the choice to select Data Engineering as a specialisation. Applications close on 30 June for admission for the following year. Late applications will be considered if there are still places available; keep checking the website (www.ee.sun.ac.za) to confirm the application deadline.

## Any postgraduate opportunities?

Definitely! This new course will feed into the School for Data Science and Computational Thinking at Stellenbosch University. The School will work across all faculties in an interdisciplinary way and will span from under- and postgraduate courses to research and specialist consultation. So there'll be multiple opportunities across a range of fields in data sciences. Also, as a specialisation of Electrical and Electronic Engineering, you'll be able to enter any postgraduate courses offered by the department.

## Where will I find work after graduating?

As a data engineer, you'll be able to work in any organisation that has complex systems and generates data, and there are millions of those! From corporates to consultancies, retail to renewables, manufacturing to mining, finance to fashion: Data Engineering provides innovating solutions to real-world challenges.

**Scan the QR code to visit the website of the Department of Electrical and Electronic Engineering:**

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