Stellenbosch UNIVERSITY IYUNIVESITHI UNIVERSITEIT

Dept. of Electrical and Electronic Engineering

FAQ - Document

Dear future Electrical and Electronic Engineering students!

This document serves to anticipate some of your basic questions. We also answer some questions related to the difference between Data Engineering and Electrical and Electronic (E&E) engineering, since these two subject areas do have some overlap. Finally, any questions related to admission requirements (i.e. required school grades) will be answered.

If you really want to get into the exact details, you can Google search "Engineering yearbook Stellenbosch" and specifically look for the sections related to Electrical and Electronic Engineering. You can also visit the E&E website at https://ee.sun.ac.za/

Questions and (hopefully good) answers

Q: Briefly, what is E&E Engineering as a discipline?
A: E&E engineering is a specialized field within engineering that revolves around the study, design, and application of electrical systems and electronic devices. It encompasses a wide spectrum, from power generator, transmission, and distribution to the creation of electronic circuits, microprocessors, and control systems for applications across industries like telecommunications, renewable energy, robotics, and healthcare. E&E demands a solid grasp of mathematics, physics, and computer science to innovate, develop, and implement solutions that power our modern world, impact everything from daily gadgets to largescale infrastructure.

Q: What is the difference between Electrical Engineering and Electronic Engineering?
A: While there's overlap between the two fields, electrical engineering leans toward power generation (renewable energy), transmission and motor design (electric vehicles), while electronic engineering is more about designing the electronic components and systems themselves, as well as software related work. At Stellenbosch, you get to specialise into some of our more specific disciplines in your 4th year. **Your options will be:**

- **Energy**: You will learn about electric motors, power generation, power electronics, renewable energy, energy control and computer-controlled power management
- **Telecommunication and Electromagnetics**: Focus on high-frequency techniques and the transmission or reception of data.
- **Informatics**: Focus on high-level computer science, software systems such as Internet communication, virtual storage, hardware, and software design.
- **Robotics**: The design of robot vehicles, unmanned aeroplanes, and satellites. Modules include control systems, computer, systems & computer science.
- **Data Engineering:** Finding trends and patterns in data sets. Developing algorithms to help make raw data more useful.

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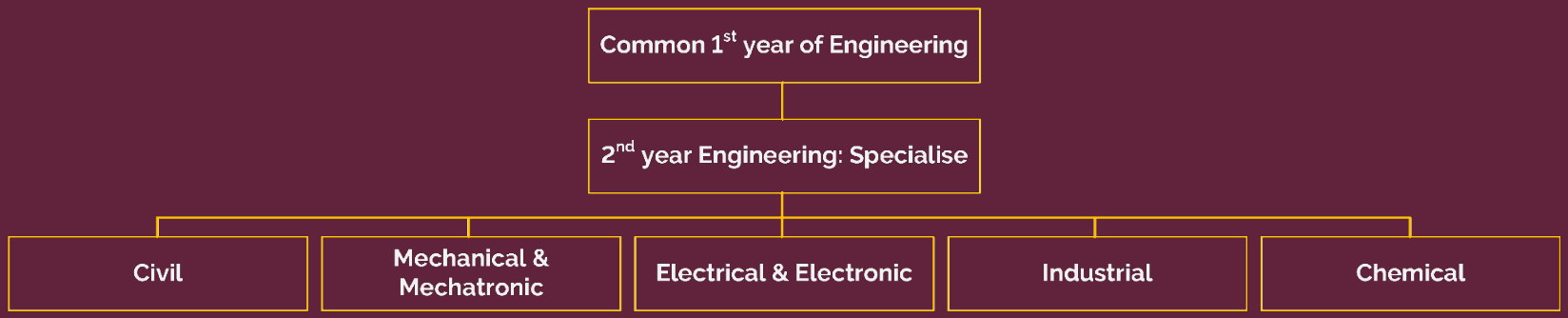
Q: What about Data Engineering? Is this part of the E&E engineering degree?

A: As a general undergraduate E&E student you will learn about data handling and machine learning. However, if you want to be a data engineering specialist, then you will have to indicate this from your 1st year of studies. Unlike the other E&E students who only specialise in their 4th year of study (see previous question answer), you will specialise as an E&E student in the discipline of Data Engineering. However, you must be very sure that you want to be a Data Engineer, because once you have decided, you cannot change to another E&E discipline, without affecting the length (4 years) of your degree. Data Engineers typically have other modules outside of the general E&E department (like statistics and computer science related modules), which means that you will first have to catch up on some of the other E&E modules (which Data Engineering students do not take part in) before you can specialise in a different E&E discipline (Robotics, Energy, etc.). This "catching up" will result in an extra year of studies. Therefore, you must be very sure that you want to immediately specialise in Data Engineering from your 1st year of studies.

Q: How does 1st year at E&E look like in terms of academics?

A: All engineering students (except Data engineers) have the same general 1st year as illustrated in the image below. This is to give you a basic exposure to all engineering disciplines like Mechanical engineering, Chemical engineering, etc. However, in your 2nd year you will have to decide in which engineering discipline you would like to specialise. For example, if you have entered as a Mechanical engineering student in your 1st year, but you realise that you really enjoyed the 1st year electrical modules, then you can shift from Mechanical to E&E engineering in your 2nd year of studies. However, if you have entered Stellenbosch University as a Data Engineering student, then you are limited in your ability to change to another engineering discipline in your 2nd year. (See next question for detail.)



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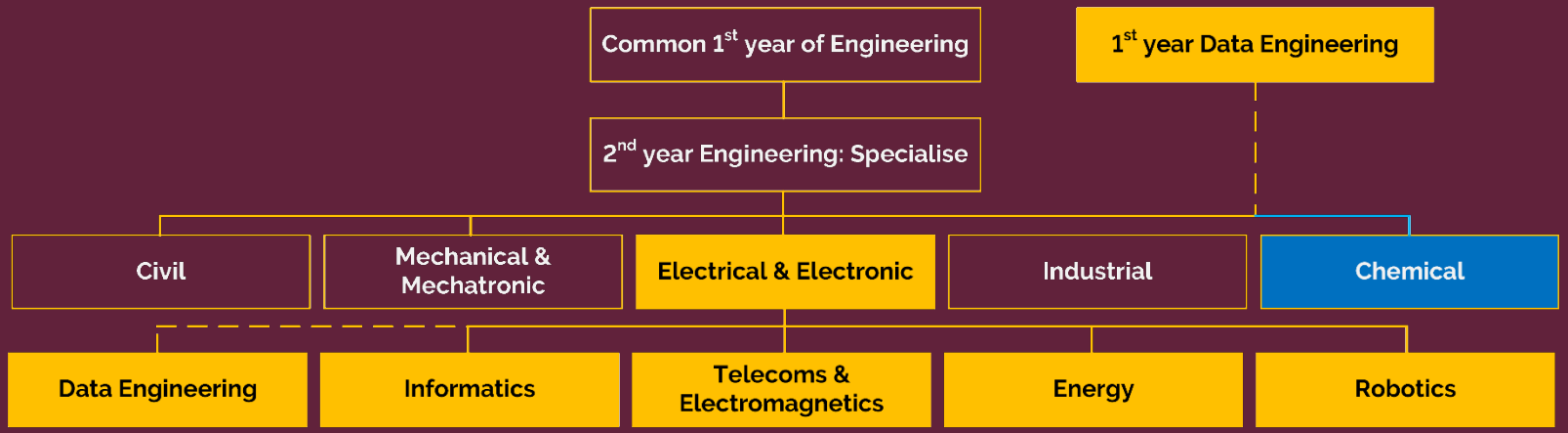
Q: If I realise during 1st year, I do not want to be a Data Engineer, what are my options?

A: Please refer to the previous two questions for context, before you continue to read this answer. As mentioned, you must immediately specialise as a Data Engineering (which falls under the E&E dept.) student in your 1st year. If you want to remain an E&E student, but you would like to specialise in another field of E&E disciplines, then you must shift away from Data Engineering to general E&E Engineering. If you make the shift in your 3rd or final year of studies, then you will have to catch-up on some of your other E&E modules before you can specialise in another E&E discipline in your final year (other than Data Engineering). This will result in an extra year of studies. However, if you decide that you no longer want to be a Data Engineer and none of the E&E disciplines interest you, then you would want to shift away from E&E to another Engineering discipline. However, as indicated in the diagram below, this will not be possible to do without prolonging your studies from 4 years to 5+ years. The only shift that 1st year Data Engineers can make in their 2nd year of studies, without affecting the 4 years of me required to complete the degree, is general E&E engineering or Chemical engineering.



Q: As an E&E engineering student, can I study in the fields related to Machine Learning or "Artificial Intelligence"?

A: Yes, absolutely. Although Data Engineering students will have a more in-depth approach to this, as a final year E&E student, you can specialise in any of the other E&E disciplines, which allow for Computer Science and Data Analytics as either prescribed or elective modules.

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Q: What about my school grades? What are the minimum requirements to be able to apply for engineering as a 1ste year student? **A**: The minimum admission requirements are as follows:

a) A National Senior Certificate with admission to bachelor's studies, or an exemption certificate issued by the Matriculation Board, and
b) A minimum average of at least 70% using the six best matric subjects (excluding Life Orientation and Mathematical Literacy, and
c) A minimum average of at least 70% for Mathematics, and
d) A minimum average of at least 60% for Physical Sciences, and
e) Language minima:
   - English Home Language: At least 50%, with no Afrikaans requirement; or
   - English First Additional Language: At least 60%, with no Afrikaans requirement; or
   - English First Additional Language: At least 50%, together with Afrikaans Home Language of at least 50%; or
   - English First Additional Language: At least 50%, together with Afrikaans 2nd Additional Language of at least 60%

The selection score is the most important measure used by the Faculty for selecting students. This score is calculated as follows:
Selection score = Mathematics mark + Physical Sciences mark + 6 x Matric average

i. The percentages you obtained in Mathematics and Physical Sciences, plus the average percentage of your six best matric subjects (excluding Life Orientation and Mathematical Literacy), are used for calculating the selection score. ii. This means that the selection score takes a broad group of matric subjects into account, and that, in effect, Mathematics and Physical Sciences usually each contribute twice.

iii. The maximum score obtainable is therefore 800 if you achieve 100% for all your matric subjects (100 + 100 + (6 X 100) = 800) iv. The Faculty sets an admission threshold and a minimum selection score for each BEng programme. The admission threshold is a selection score based on:

1. the number of applicants who meet the admission requirements, and 2.
the number of places available in the degree programme.

v. The minimum selection score is the lowest score that indicates that a student will be reasonably likely to complete the programme. This score is based on the Faculty's experience with previous students.

vi. You will be selected if you:

1. meet the admission requirements and
2. your selection score is equal to, or larger than, the admission threshold score for the particular degree programme that you want to follow.

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Please note that:

- Being selected for one BEng programme does not mean that you have been selected for another BEng programme.
- You may apply for more than one BEng programme and you will be considered for each programme independently. If you are selected for more than one BEng programme, you will receive more than one offer to choose from.
- If your selection score is below the admission threshold, but above the minimum admission requirements for your preferred BEng programme(s), the following happens:
    - you are placed on a waiting list, which means that you may still be admitted to a particular programme if places become available later; or
    - you can apply to be admitted to another BEng programme if you meet the selection requirements for that particular programme. You must contact the Faculty Officer or the Faculty Administrator if you consider changing the programmes you applied for.