

CAMPUS

DURBANVILLE
(CAPE TOWN)

DESCRIPTION

Mechatronic Engineering is the perfect blend of mechanical, electronic, computer and control engineering to design and develop smart systems and technologies. Think robots, automated cars, drones, and even advanced manufacturing equipment – all brought to life by mechatronics. If you love solving problems, tinkering with tech, or dreaming about the future, Mechatronic Engineering is for you.

The Higher Certificate in Mechatronic Engineering programme aims to provide students with a strong mechanical and electronic engineering foundation, focusing on integrating these fields to design, build, and maintain advanced automation systems and robotic technologies. Mechatronics is an interdisciplinary field combining mechanical engineering, electronics, computer, and control engineering elements to develop smart machines and automated systems. The programme is an excellent way to start a career in the rapidly growing field of automation, robotics, and smart technologies. The skills learned during the programme are highly applicable in manufacturing, automotive, aerospace, and even healthcare industries, where advanced machinery and automation are becoming increasingly vital. With a blend of theoretical learning and practical application, this programme prepares students for an exciting career in the cutting-edge field of mechatronics.

This programme provides an alternative access pathway for students who show potential but did not fully meet the standard admission requirements in Mathematics and/or Physical Sciences. Students admitted under conditions will complete foundational modules in Engineering Mathematics and/or Engineering Physics alongside selected first-semester Higher Certificate modules. These foundational modules strengthen core knowledge and skills needed for success in the programme. Students must successfully pass the required foundational module(s) to continue with the Higher Certificate without conditions. Once passed, they join the mainstream academic track and continue their studies in alignment with the standard programme structure and progression requirements.

ADMISSION REQUIREMENTS (WITH CONDITIONS)

- a Senior Certificate (SC); **OR**
- a National Senior Certificate (NSC) **with**;
 - English (Home language or first additional language) on at least level 3 (40-49%);
 - NSC Achievement rating of at least 3 (40-49%) for Mathematics or Technical Mathematics;
 - NSC Achievement rating of at least 3 (40-49%) for Physical Science or Technical Science; **OR**
- a National Senior Certificate – Vocational Level 4 (NC(V)) **with**;
 - NCV Achievement rating of at least 4 (50–59%) in English Language and Mathematics and Engineering Science;

Successful applicants will be enrolled in Introduction to Engineering Mathematics and/or Introduction to Engineering Physics, depending on the module requirement. These foundational modules will be taken alongside two Higher Certificate modules, namely Engineering Professional Skills and Electromechanic Technology. During the initial six-week period, students will focus on the bridging module(s) instead of enrolling in Mathematics I and Physics I. At the end of this period, they will complete a formal assessment in the relevant module(s) for which they need to achieve a 50% pass mark. Students must pass the required module(s) to gain full admission into the Higher Certificate programme and continue their studies. If a student does not meet the required standard, they will not be permitted to progress further, as this forms part of the conditions of their admission.

CAREER OPPORTUNITIES

ENGINEER SUPPORT STAFF IN MECHATRONIC ENGINEERING FIELD

ENGINEERING TECHNICAL ASSISTANT ON MECHATRONIC ESTABLISHMENTS

MECHATRONIC ENGINEERING TECHNICAL ASSISTANT

MECHATRONIC ENGINEERING TECHNICAL ASSISTANT TO ENGINEERING CONTRACTORS

SPECIFIC REQUIREMENTS

EQUIPMENT REQUIREMENTS

Registered students will be required to have access to the following equipment before their studies can commence:

- Smart device suitable for online learning
- USB to transfer information between devices and locations
- Laptop compatible with software covered in the programme. Student Recruitment can provide minimum device specifications if required.

ADDITIONAL EXPENSES

The following costs may arise during the programme. These are not included in the tuition fees and should be budgeted for accordingly:

- Specialised stationery, textbooks, or equipment
- Printing and presentation costs
- Practical components
- Industry visits (petrol, entrance fees etc)

ACCESS TO TECHNOLOGY

STADIO provides students with materials, resources, assessments (including online tests and quizzes), discussion opportunities, and administrative services through its student administration and learning environments. Access to the online facilities is essential for efficient communication, learning and success. You will need continuous access to study, using the resources mentioned above, and accessing and submitting some assessments.

SYSTEM REQUIREMENTS

Students should also have access to the following resources/systems to ensure a seamless learning experience:

- Reliable broadband internet access (WI-FI is available at all our campuses, but you may prefer access from home as well)
- Firefox/Microsoft Edge/Chrome web browser
- Microsoft Word
- PDF Viewer
- Ability to scan and upload documents
- Email/cellphone for notification and communication

PRACTICAL COMPONENTS

STADIO will provide laboratories with all the equipment students need for the practical sessions. Students are also provided with a toolkit and multimeter to use in the laboratories. While the School will furnish specific essential consumables, every student must obtain the needed electronic components and wires to build small electronic circuits for practical experiments. The list of required items will be supplied to students at the start of the semester.

CURRICULUM OUTLINE

SEMESTER 1	1st YEAR		PRICE
Compulsory (Bridging Modules)	Introduction to Engineering Mathematics AND / OR Introduction to Engineering Physics	EMAH001 AND / OR EPHH001	R2 000 PER MODULE
Compulsory (All)	Electromechanic Technology I	EMTH152 (20 credits)	R9 000
	Engineering Mathematics I	EMAH152 (20 credits)	R9 000
	Engineering Physics I	EPHH152 (10 credits)	R4 500
	Engineering Professional Skills	EPSH152 (20 credits)	R9 000
SEMESTER 2	1st YEAR		PRICE
Compulsory (All)	Mechanotechnology	MET152 (20 credits)	R9 000
	Mechatronic Design Project	MDE152 (20 credits)	R9 000
	Mechatronic Systems	MSY152 (20 credits)	R9 000
	Smart Manufacturing	SMM152 (10 credits)	R4 500
CREDITS PER YEAR	140		

MODULE DESCRIPTIONS

ELECTROMECHANIC TECHNOLOGY I

This module provides the fundamental underpinning of basic electrical and mechanical engineering knowledge and phenomenon. Electromechanics focuses on the interaction of electrical and mechanical systems as a whole and how the two systems interact with each other.

ENGINEERING MATHEMATICS I

This module introduces and strengthens fundamental mathematics knowledge to support basic science and discipline-specific engineering science modules in the curriculum and provide a foundation for further studies.

ENGINEERING PHYSICS I

This module teaches students the fundamental underpinning concepts and principles related to the mechanics, electricity, and magnetism necessary to support basic discipline specific engineering-science modules.

ENGINEERING PROFESSIONAL SKILLS

This module provides the fundamental skills to harness the power of ICT to support engineering in various disciplines. The module aims to develop students who will use these skills consistently, fairly, and effectively while considering the framework of the South African engineering environment.

INTRODUCTION TO ENGINEERING MATHEMATICS

This six-week foundational module is designed to strengthen and consolidate Grade 12 Mathematics concepts essential to success in first-year Engineering. The purpose of this module is to ensure that students develop the confidence, problem-solving ability, and mathematical fluency required to progress to Mathematics I.

INTRODUCTION TO ENGINEERING PHYSICS

This six-week foundational module revises and reinforces core Grade 12 Physical Sciences concepts that underpin first-year Engineering Physics. The module aims to strengthen conceptual understanding, analytical thinking, and problem-solving skills to prepare students for Physics I.

MECHANOTECHNOLOGY

This module will provide students with the understanding and analysis of control systems, electrical machines, and the integration thereof within a mechatronic engineering environment, as well as Mechanical engineering knowledge underpinning mechatronics.

MECHATRONIC DESIGN PROJECT

This module will provide the fundamental underpinning knowledge to wire, configure, test and integrate a mechatronic system application and will introduce fundamental discipline specific engineering knowledge to support basic science modules in underpinning the mechatronics project.

MECHATRONIC SYSTEMS

This module will provide the fundamental skills and introduce fundamental discipline specific engineering knowledge to support basic science modules underpinning Mechatronics.

SMART MANUFACTURING

This module will provide the student with the fundamental knowledge of modern Smart processes applied to engineering manufacturing