

24.1.1 Purpose of the programme

The purpose of the qualification is to develop an engineering intellectual who can identify, assess and formulate the engineering needs of the society at large, and research and solve the identified engineering problems creatively and innovatively, by applying scientific, mathematical, engineering, economic and other relevant principles and methods. The qualification prepares students for an engineering science, design and project-based career through fundamental understanding, use and appropriate application of engineering methods, skills, tools and information technology. The qualification also provides a platform for lifelong learning.

24.1.2 Outcomes

The student should be able to:

1. Identify, assess, formulate, interpret, analyse and solve engineering problems creatively and innovatively by applying knowledge of mathematics, basic science and engineering sciences from first principles.
2. Plan and manage small engineering projects, demonstrating fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) engineering practice.
3. Work effectively, individually and with others, as a member of a team, group, organisation, and community or in multi-disciplinary environments.
4. Organise and manage him/herself and his/her activities responsibly, effectively, professionally and ethically, accept responsibility within his/her limits of competence and exercise judgment based on knowledge and expertise.
5. Plan and conduct appropriate levels of investigation, research and/or experiments by applying relevant theories and methodologies, and perform appropriate data analysis and interpretation.
6. Communicate effectively, both orally and in writing, with engineering audiences and the community at large, using appropriate structure, style and graphical support.
7. Use and assess appropriate research methods, skills, tools and information technology effectively and critically in engineering practice, and show an understanding and a willingness to accept responsibility for the impact of engineering activities on society and the environment.
8. Perform procedural and non-procedural design and synthesis of components, systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impact and benefits.
9. Employ various learning strategies and skills to master module outcomes required for preparing him/herself to engage in continuous learning, to keep abreast of knowledge and skills required in the inter-disciplinary field.
10. Participate as a responsible citizen in the life of local, national and global communities by acting professionally and ethically.
11. Demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of engineering activities.
12. Explore, where applicable, education and career opportunities.
13. Organise and develop entrepreneurial opportunities through engineering problem-solving, design, technical research and managerial skills.

24.1.3 Admission Requirements and Selection Criteria

Refer to Faculty Regulation E.3 for the minimum admission requirements for this programme.

Students are selected on academic merit and a personal interview, if deemed necessary.

The number of student enrolments will be limited.

24.1.4 Promotion Requirements

Refer to Faculty Regulations EB4 and EB5, stipulating the promotion requirements for Engineering Sciences programmes and the requirements for awarding a passed with distinction BEng degree.

24.1.5 Curriculum

CODE	MODULE	CODE	MODULE
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First year

First semester		Second semester	
APM01A1	Applied Mathematics 1A (Engineering)	APM01B1	Applied Mathematics 1B (Engineering)
IINEEA1	Introduction to Engineering Design 1A	PJCEEB1	Project Communication 1B
MATENA1	Engineering Mathematics 1A	MATENB1	Engineering Mathematics 1B
PHYE01A	Engineering Physics 1A	PHYE0B1	Engineering Physics 1B
CEM01A1	Chemistry 1A	ETNEEB1	Electrotechnics 1B
EEMEEA1	Electrical Engineering Methods 1A		

Second year

First semester		Second semester	
APM02A2	Applied Mathematics 2A	APM02B2	Applied Mathematics 2B
ETNEEA2	Electrotechnics 2A	ETNEEB2	Electrotechnics 2B
MATEAA2	Engineering Mathematics 2A2	MATEAB2	Engineering Mathematics 2B2
MATECA2	Engineering Mathematics 2A1	MATECB2	Engineering Mathematics 2B1
PHYE2A2	Engineering Physics 2A	IEP2BB2	Engineering Economics and Practice 2B
MODEEA2	Modelling 2A	MTKEEB2	Science of Materials 2B
PJEELA2	Electrical Projects 2A	TRDMCB 2	Thermodynamics 2B

Third year

First semester		Second semester	
AMDEEA3	Advanced Modelling 3A	BHSEEB3	Control Systems 3B
EMNEEA3	Electromagnetics 3A	EKAEEB3	Electronics 3B
KRLAEA3	Power Systems 3A	EEPEEB3	Electrical Engineering Practical 3B
STAE0A3	Statistics for Engineers 3A	PJBEEB3	Project Management 3B
SSTEEA3	Signals and Systems 3A	RKEEE3B	Computer Systems 3B
AFINSA1	African Insights	SIGEEB3	Signal Processing 3B
SIOEEA3	Systems Engineering and Design 3A	SIOEEB3	Systems Engineering and Design 3B
		TELEEB3	Telecommunications 3B

Fourth year

First semester		Second semester	
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BHSEEA4	Control Systems 4A	EMNEEB4	Electromagnetics 4B
RKEEEA4	Computer Systems 4A	EMAEEB4	Electrical Machines 4B
HSEEEA4	High Speed Electronics 4A	KRLEEB4	Power Systems 4B
PWEEA4	Power Electronics 4A	OTSEEB4	Optical Systems 4B
EEPEEA4	Electrical Engineering Practical 4A	RTIENB4	Legal Applications in Engineering Practice 4B
PJEEEA4	Project Investigation (Electrical) 4A	PJEEEB4	Project Investigation (Electrical) 4B
SIGEEA4	Signal Processing 4A		
TELEEA4	Telecommunications 4A		

