24.3.1 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.

24.3.2 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 or with others, as a member of a team, group, organisation, 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 limited investigations, research and experiments commensurate with the level of competence by applying appropriate theories and methodologies, and perform 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 engineering 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, where applicable, their social, legal, health, safety and environmental impact and benefits.
9. Employ various learning strategies and skills to master module outcomes required in fundamental mathematics, engineering sciences, engineering design research and aspects of management, thereby preparing him/herself to engage in lifelong learning, to keep abreast of knowledge and skills required in the engineering field.
10. Participate as a responsible citizen in the life of local, national and global communities by acting professionally and ethically.
11. Demonstrate cultural and aesthetic sensitivity across a range of social contexts in the execution of engineering activities.
12. Explore education and career opportunities.
13. Organise and develop entrepreneurial opportunities through engineering problem-solving, design, technical research and managerial skills.

24.3.3 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.

24.3.4 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.

24.3.5 Curriculum

CODE	MODULE	CODE	MODULE
First year			
First semester		Second semester	
APM01A1	Applied Mathematics 1A	APM01B1	Applied Mathematics 1B
IINEEA1	Introduction to Engineering Design 1A	DRGCIB1	Draughting for civil engineers 1B
MATENA1	Engineering Mathematics 1A	MATENB1	Engineering Mathematics 1B
PHYE0A1	Engineering Physics 1A	PHYE0B1	Engineering Physics 1B
CEM01A1	Chemistry 1A	ETNEEB1	Electrotechnics 1B
		BTKCIB1	Concrete Technology1B
Second year			
First semester		Second semester	
APM02A2	Applied Mathematics 2A	APM02B2	Applied Mathematics 2B
MATEAA2	Engineering Mathematics 2A2	MATEAB2	Engineering Mathematics 2B2
MATECA2	Engineering Mathematics 2A1	MATECB2	Engineering Mathematics 2B1
MGACIA2	Applied Mechanics 2A	SMCCIB2	Strength of Materials for Civil Engineers 2B
GLG01A1	Geology 1A	HTA3BB3	Heritage Assessment 3B
STRCIA2	Fluid Mechanics 2A	ENME0B2	Environmental Management for Engineers 2B
MODEEA2	Modelling 2A	COM0B22	Communication 2B
Third year			
First semester		Second semester	
GTGCIA3	Geotechnical Engineering 3A	GTGCIB3	Geotechnical Engineering 3B
SUSCIA3	Structural Engineering 3A	SUSCIB3	Structural Engineering 3B
HMGCIA3	Hydraulic Engineering 3A	HMGCIB3	Hydraulic Engineering 3B
STAE0A3	Statistics for Engineers 3A	VVICIB3	Transportation Engineering 3B
AFINSA1	African Insights	PJBCIB3	Project Management 3B
VVICIA3	Transportation Engineering 3A	OPMCIB3	Surveying 3B
Fourth year			
First semester		Second semester	
GTGCIA4	Geotechnical Engineering 4A	OWSCIB4	Civil Design 4B

PJBCIA4	Project Management 4A	PJSCIB4	Civil Project Investigation 4B
SUSCIA4	Structural Engineering 4A1	CPPCIB4	Civil Professional Practice 4B
SDICIA4	Urban Hydraulics 4A	RTICIB4	Legal Applications in Engineering Practice 4B
UDSCIA4	Urban Development Studies 4A		
SUCCIA4	Structural Engineering 4A2		