24.4.1 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 te bchnology. The qualification also provides a platform for lifelong learning.

24.4.2 Outcomes

The student should be able to:

1. Identify, assess, formulate, interpret, analyse and solve engineering problems creatively and innovatively by applying 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 by applying appropriate 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, 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 context 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.

24.4.3 Admission Requirements and Selection Criteria

Refer to Faculty Regulation EB3 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.

24.4.4 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.

24.4.5 Curriculum

CODE	MODULE	CODE	MODULE
First year			
First semester		Second semester	
APM01A1	Applied Mathematics 1A	APM01B1	Applied Mathematics 1B
GKMEEA1	Graphical Communication 1A	GKMEEB1	Graphical Communication 1B
IINEEA1	Introduction to Engineering Design 1A	IINEEB1	Introduction to Engineering Design 1B
MATENA1	Engineering Mathematics 1A	MATENB1	Engineering Mathematics 1B
PHYE0A1	Engineering Physics 1A	PHYE0B1	Engineering Physics 1B
CEM01A1	Chemistry 1A	ETNEEB1	Electrotechnics 1B
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
OWMMCA2	Design (Mechanical) 2A	OWMMCB2	Design (Mechanical) 2B
ETNEEA2	Electrotechnics 2A	MTKMCB2	Science of Materials 2B
STRCIA2	Fluid Mechanics 2A	SLRBCB2	Strength of Materials 2B
MODEEA2	Modelling 2A	TRDMCB2	Thermodynamics 2B

Third year

First semester		Second semester	
AFINSA1	African Insights	INPMCB3	Engineering Practice 3B
OWMMCA3	Design (Mechanical) 3A	MKEMCB3	Theory of Machines 3B
STAE0A3	Statistics for Engineers 3A01	OWMMCB3	Design (Mechanical) 3B
STRMCA3	Fluid Dynamics 3A	VVEMCB3	Manufacturing Methods 3B
		SLRBCB3	Strength of Materials 3B
TMSMCA3	Thermofluids 3A	COMMCB3	Communication 3B
MTKMCA3	Science of Materials 3A		
MLAMCY3	Mechanical Engineering Laboratory 3	MLAMCY3	Mechanical Engineering Laboratory 3

Fourth year

First semester		Second semester	
OIPMCY4	Design and Engineering Practice 4	OIPMCY4	Design and Engineering Practice 4 (Year module)
PJMMCY4	Project Investigation (Mechanical) 4	PJMMCY4	Project Investigation (Mechanical) 4 (Year module)
WAOMCA4	Heat Transfer 4A	RTICIB4	Legal Applications in Engineering Practice 4B

SLRBCA4	Strength of Materials 4A	EBP3B21	Management Principles and Practice 3B
TRMMCA4	Thermomachines 4A	TMLMCB4	Thermal Systems 4B
MVSMCA4	Advanced Manufacturing Systems 4A	TKNMCB4	Control Systems (Mechanical) 4B