

21.8.1 Purpose of the programme

The purpose of the BEngTech (Physical Metallurgy) is thus to build the necessary knowledge, understanding, abilities and skills required for further learning towards becoming a competent, practicing Metallurgical Technologist. Specifically, the qualification provides graduates with:

- preparation for careers in engineering itself and areas that potentially benefit from engineering skills, for achieving technological proficiency and to make a contribution to the economy and national development;
- the educational base required for registration as a Professional Engineering Technologist with ECSA;
- for graduates with an appropriate level of achievement, the ability to enter NQF level 8 programmes and then proceed to Master’s degrees;

21.8.2 Outcomes

Students who complete this programme will be able to:

- systematically diagnose and solve broadly defined metallurgical problems by applying engineering principles;
- apply knowledge of mathematics, natural science and engineering sciences to defined and applied engineering procedures, processes, systems and methodologies to solve broadly-defined metallurgical problems;
- perform procedural and non-procedural design of broadly defined components, systems, works, products or processes to meet desired needs normally within applicable standards, codes of practice;
- conduct investigations into broadly-defined problems by locating, searching and selecting relevant data from codes, databases and literature, designing and conducting experiments, and analyzing and interpreting results in order to provide valid conclusions;
- use appropriate techniques, resources, and modern engineering tools, including information-technology, prediction and modeling, for the solution of broadly-defined metallurgical problems with an understanding of the limitations, restrictions, premises, assumptions and constraints;
- communicate effectively, both orally and in writing, with engineering audiences and affected parties;
- demonstrate knowledge and understanding of the impact of metallurgical activity on the society, economy, industrial and physical environment, and address issues by analysis and evaluation;
- demonstrate knowledge and understanding of metallurgical management principles and apply these to one’s own work, as a member and leader in a team and to manage projects;
- engage in independent and life-long learning through well-developed learning skills; and
- comprehend and apply ethical principles and commit to professional ethics, responsibilities and norms of metallurgical technology practice.

21.8.3 Curriculum

CODE	MODULE	CODE	MODULE
First year			
First semester		Second semester	
AFINSA1	African Insights	CETM1B1	Engineering Chemistry (Metallurgy) 1B
CPSELA1	Computer Skills 1A	ECS1BB1	Engineering Communication Skills 1B

CETM1A1	Engineering Chemistry (Metallurgy) 1A	MATE1B1	Engineering Mathematics 1B
ECS1AA1	Engineering Communication Skills 1A	PHYE1B1	Engineering Physics 1B
EDRMIA1	Engineering Drawing 1A	METMTB1	Fundamentals Of Metallurgy 1B
MATE1A1	Engineering Mathematics 1A	MPRMTB1	Metallurgy Engineering Practice 1B
PHYE1A1	Engineering Physics 1A	STAE1B1	Engineering Statistics 1B

Second year

First semester		Second semester	
HMTMTA2	Heat and Mass Transfer 2A	MTTMTB2	Material Testing 2B
MTTMTA2	Material Testing 2A	MMENTB2	Mechanical Metallurgy 2B
MMENTA2	Mechanical Metallurgy 2A	MTDMTB2	Metallurgical Thermodynamics 2B
PMTMTA2	Physical Metallurgy 2A	PMTMTB2	Physical Metallurgy 2B
ALLMTA2	Structure And Properties Of Alloy 2A	QUAMTB2	Quality Techniques 2B

Third year

First semester		Second semester	
CORMTA3	Corrosion Technology 3A	AMAMTB3	Advanced Engineering Materials 3B
FOUMTA3	Foundry Technology 3A	CDSMTB3	Casting Design And Simulation 3B
MDEMTA3	Mechanical Deformation Technologies 3A	PEMMTB3	Metallurgical Project 3B
PISMTA3	Production Of Iron And Steel 3A	PMCMTB3	Powder Metallurgy And Ceramic Material 3B
PRMMTA3	Project Methodology 3A	PMEMTB3	Principles Of Management & Economics 3B
		REFMTB3	Refractory Technology 3B
		WLDMTB3	Welding Technology 3B