CHAPTER 20

FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY

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SENIOR LECTURER	Dr HE Brink, PhD (US)

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Dr G Makanda, PhD (UKZN)
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JUNIOR LECTURER

Mr MJ Mphuthi, BSc Hons (UFS)

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1. RULES OF THE FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY

The following rules are supplementary to the rules of the Central University of Technology, Free State (CUT):

2. DURATION OF SEMESTER AND YEAR LEARNING PROGRAMMES

For Electrical, Mechanical and Civil Engineering, there are two intakes per year, i.e. one in January and one in July. For all other learning programmes presented in the Faculty, there is only one intake per year, i.e. in January.

The duration of a semester is approximately six months.

The first semester extends from January to June, whilst the second semester extends from July to November.

3. STRUCTURE OF LEARNING PROGRAMMES (REFER TO THE REMARKS PRINTED UNDER EACH LEARNING PROGRAMME)

4. NATIONAL DIPLOMA, DIPLOMA AND DEGREE LEARNING PROGRAMMES

4.1 National diploma and Baccalaureus Technologiae (BTech) programmes

These programmes will be phased out. The last new intake for all national diploma programmes was July 2017. All students that were enrolled in national diploma programmes will be allowed to complete their studies according to the phase-out schedule.

The student has the option of exiting upon successful completion of the first three years of study, thereby earning a national diploma. Diploma programmes in Engineering and Building consist of two components, namely the formal study period, and a period of work-integrated learning (WIL).

Formal study period:
The period of formal study at CUT extends over four semesters.

WIL period (Engineering and Building programmes):
The period of compulsory WIL training applicable to each programme, to be completed at a suitable place of employment, extends over two semesters.

A student may register for a BTech degree in the fourth year, upon successful completion of a national diploma. Admission to the BTech year of study is subject to certain prerequisites (see specific learning programme). Some of the final annual instructional offerings for the BTech in learning programmes related to Engineering are presented on either a full-time or a part-time block basis. A minimum of one year's WIL is to be completed before BTech studies in the field of Engineering can commence. Further information is available from the relevant Heads of Department (HoDs) or the Faculty Officer.

4.2 Diploma in Engineering Technology and Bachelor in Engineering Technology programmes

The first intake for these programmes is January 2018.

The student has the option to enrol for either the Diploma in Engineering Technology (DipEngTech) or for the Bachelor in Engineering Technology (BEngTech).

4.2.1 Diploma in Engineering Technology

Formal study period: Four semesters.

Articulation of the Diploma in Engineering Technology in Civil Engineering to other related qualifications is shown below.

Vertically: Diploma in Civil Engineering (NQF 6) -> Advanced Diploma in Civil Engineering (NQF 7) -> Postgraduate Diploma in Civil Engineering (NQF 8) -> Master of Engineering: Civil Engineering (NQF 9) -> Doctor of Engineering: Civil Engineering (NQF 10);

OR

Diploma in Civil Engineering (NQF 6) -> Bachelor's Degree in Civil Engineering (NQF 7) -> Postgraduate Diploma in Civil Engineering (NQF 8) -> Master of Engineering: Civil Engineering (NQF 9) -> Doctor of Engineering: Civil Engineering (NQF 10);

OR

Diploma in Civil Engineering (NQF 6) -> Bachelor's Degree in Civil Engineering Technology (NQF 7) -> Bachelor Honours in Civil Engineering (NQF 8) -> Master of Engineering: Civil Engineering (NQF 9) -> Doctor of Engineering: Civil Engineering (NQF10).

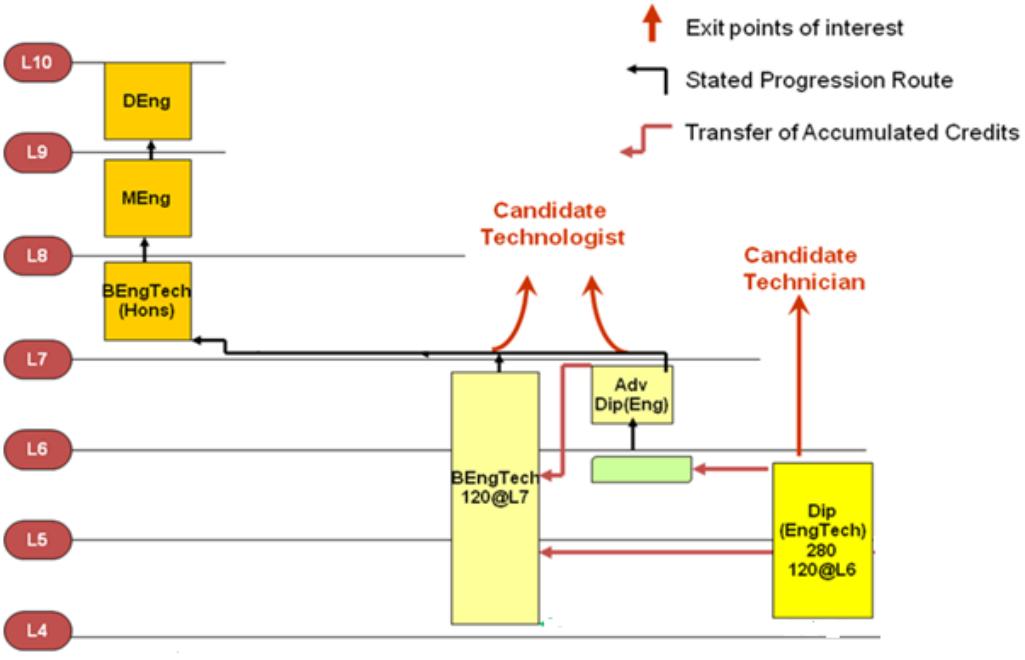


Figure 1 Articulation route

4.2.2 Bachelor in Engineering Technology

Formal study period: Six semesters.

Note: The BEngTech does not follow the DipEngTech.

5. FORMAL STUDIES

Please note that Sections 5.1 and 5.2 below are only applicable to students who are enrolled for the old programmes, for example the national diploma and BTech programmes, and must be in line with the old programmes' phase-out schedule.

5.1 Students with an employer

The student enrols directly at national diploma level, provided that he/she complies with the minimum admission requirements. After a period of one year (two semesters) at CUT, the student may return to the employer for WIL (in a programme of Engineering), or alternatively may continue with the subsequent academic part, and join the employer for WIL purposes at a later stage.

5.2 Students without an employer

The student enrols at national diploma level, provided that he/she complies with the minimum admission requirements. The student attends classes with the other groups, and at any stage after the first year (two semesters) may commence with his/her WIL training at a suitable place of employment. Upon completion of the formal study period at CUT and the prerequisite WIL (Engineering programmes), the student may either apply for a national diploma and leave the University, or continue with his/her studies towards the BTech degree.

6. REGISTRATION DURING WIL

Please note that Section 6 is only applicable to students who are enrolled for the old programmes, for example the national diploma and BTech programmes, and must be in line with the old programmes' phase-out schedule.

Employers prepare a programme for WIL in collaboration with CUT. With regard to Computer Systems, it is recommended that students complete all four semesters of study before commencing with WIL. The Centre for Work-integrated Learning and Skills Development assists in placing students with employers.

During the WIL phase, **the student must register at CUT every six months, except in the case of the Building programme, where students register in January for the full academic year**. The student compiles a report containing details of the training period, which serves as a means of monitoring the progress made in the student's WIL. The rules applicable to the writing of the report are contained in a study guide, which is available from the Secretary of the relevant department. After every semester of prescribed WIL, the student must approach the Secretary of the relevant department to arrange for an interview, during which his/her WIL is assessed by the relevant lecturer, no later than 14 days after commencing with the subsequent semester, unless otherwise stipulated in the study guides of a specific programme.

7. USE OF POCKET CALCULATORS

Unless otherwise specified for a particular instructional offering, no alphanumeric pocket calculators may be used during tests or assessments.

8. INTEGRATED TERTIARY SOFTWARE (ITS) CODES

When completing a registration or other form, the student must be certain of the correct codes used to identify the learning programme and instructional offerings selected. As accounts, class lists, progress reports and assessment results are compiled according to these codes, it is in the best interest of the student to ensure that the correct codes are used, and that he/she writes clearly.

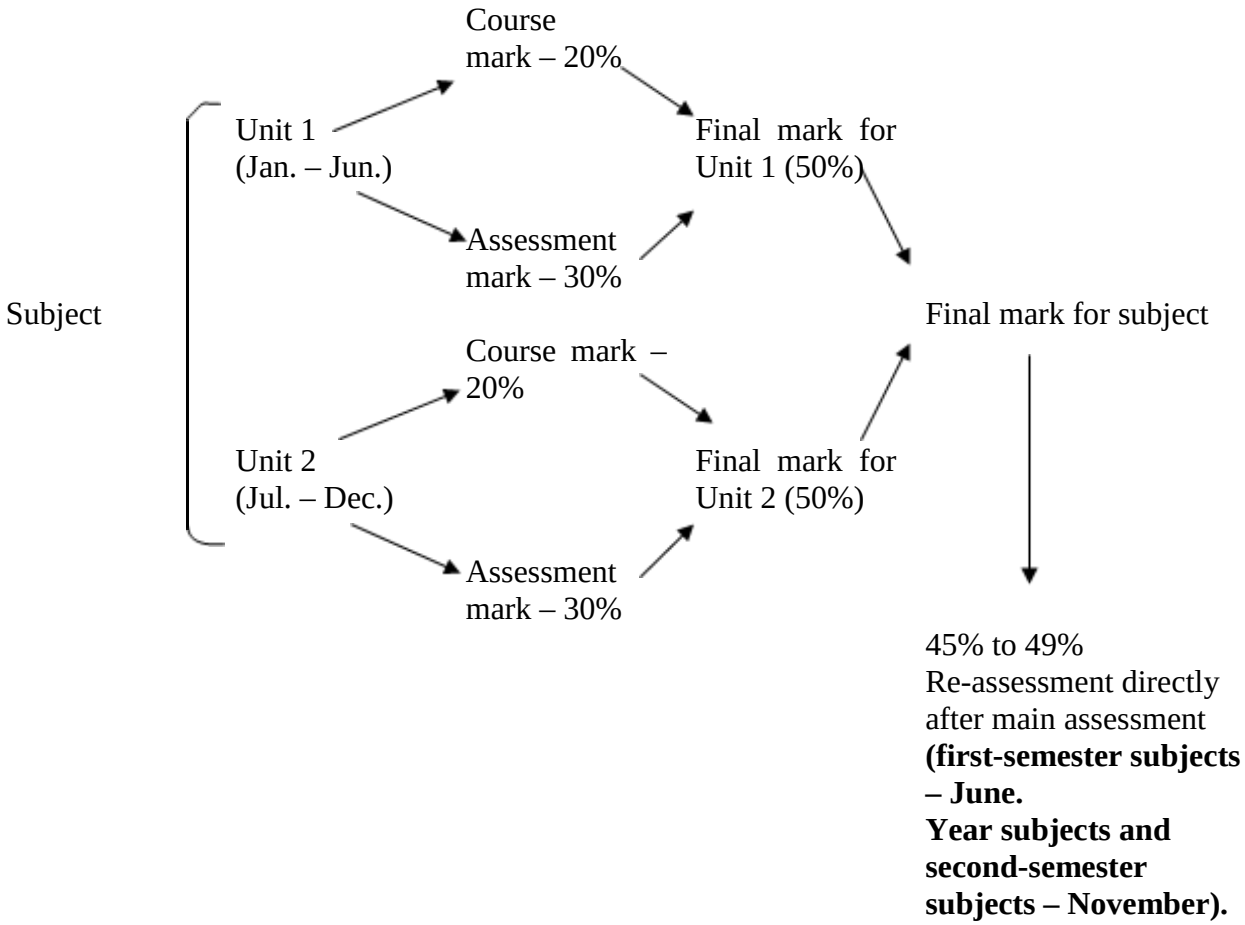
9. INTERNET-BASED LEARNING

Internet-based learning has been implemented in respect of several instructional offerings, and is used as an additional instructional support aid in the Faculty of Engineering and Information Technology. Information in this regard will be provided by the lecturers concerned.

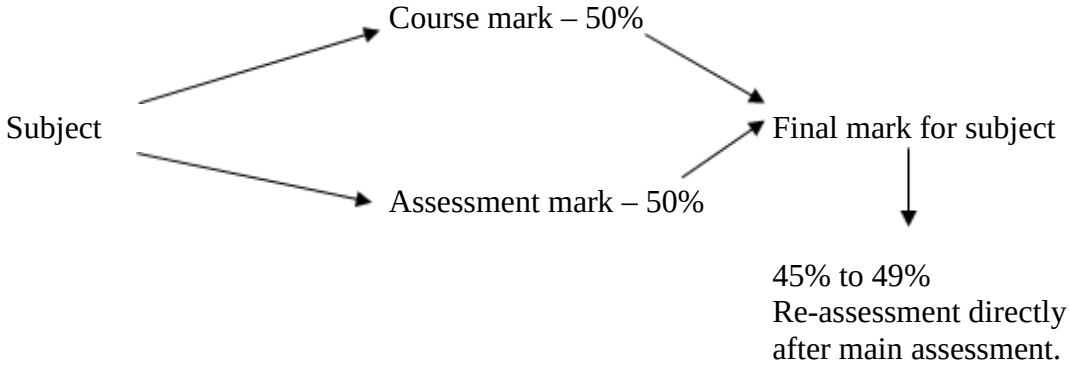
10. ASSESSMENT MODEL FOR ALL PROGRAMMES: 2018

Unless otherwise determined by a resolution of Senate, the proposed calculations for 2018 are as follows:

1. **Year subjects**



2. **Semester subjects**



10.1. ASSESSMENT AND RESULTS (ALL faculties, unless otherwise specified)

10.1.1 A subject is considered a credit, and therefore the following provisions apply:

- A student must pass any subject that is a prerequisite for another subject before he/she may register for the next level of the subject concerned.
- The pass requirements for a specific subject are as follows: A result is determined from a calculated average of tests and assessment opportunities. The minimum pass mark per subject is 50%. The minimum final mark required to pass a subject with distinction is 75%.
- **Please note that once a student has been granted a re-assessment or a special assessment as a result of illness or some other reason, no other such additional assessment will be granted.**

10.2 THE 2018 RULES FOR ALL PROGRAMMES

10.2.1 For all Engineering programmes, a subminimum mark of 50%, accumulated for practical work and projects in specified subjects, is compulsory to gain access to the relevant assessment session and to pass the subject. This rule applies to all those subjects identified as such in the study guides.

10.2.2 An admission mark of at least 40% is required for admission to the main assessments.

10.2.3 A re-assessment is granted to a candidate who has obtained a final mark of 45% to 49% in a subject. The re-assessment of a year subject – covering the subject content of the entire year – takes place directly after the main assessment in November. The re-assessment of semester subjects takes place immediately after the main assessment in June, whilst the re-assessment of second-semester and year subjects takes place in November.

Re-assessment will not be granted in continuous assessment subjects.

11. ACCREDITATION STATUS OF ENGINEERING LEARNING PROGRAMMES

The following learning programmes are accredited by the Engineering Council of South Africa (ECSA):

- Civil Engineering;
- Computer Systems Engineering;
- Electrical Engineering; and
- Mechanical Engineering.
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12. GENERAL

The student may only enrol for second-, third- or fourth-year level instructional offerings of a learning programme if he/she has passed the first-, second- or third-year level, respectively.

13. THE FOLLOWING HIGHER CERTIFICATE PROGRAMMES ARE OFFERED IN THE FACULTY:

Higher Certificate in Construction
Higher Certificate in Renewable Energy Technologies

14. THE FOLLOWING NATIONAL DIPLOMA PROGRAMMES ARE OFFERED IN THE FACULTY: ***(Phasing out – no new intakes in 2018.)***

National Diploma: Building
National Diploma: Engineering: Civil
National Diploma: Engineering: Computer Systems
National Diploma: Engineering: Electrical (Heavy Current)
National Diploma: Engineering: Electrical (Electronic Light Current)
National Diploma: Engineering: Mechanical
National Diploma: Information Technology (Software Development)
National Diploma: Information Technology (Web and Application Development)

15. THE FOLLOWING NATIONAL DIPLOMA EXTENDED CURRICULUM PROGRAMMES (ECPs) ARE OFFERED IN THE FACULTY: ***(Phasing out – no new intakes in 2018.)***

National Diploma: Engineering: Civil ECP
National Diploma: Engineering: Electrical (Heavy Current) ECP
National Diploma: Engineering: Electrical (Electronic Light Current) ECP
National Diploma: Engineering: Mechanical ECP
National Diploma: Information Technology ECP (Software Development)
National Diploma: Information Technology ECP (Web and Application Development)

16. THE FOLLOWING DIPLOMA PROGRAMMES ARE OFFERED IN THE FACULTY: ***(First first-year intake in 2018 for first three diplomas.)***

Diploma in Engineering Technology in Civil Engineering
Diploma in Engineering Technology in Electrical Engineering
Diploma in Engineering Technology in Mechanical Engineering
Diploma in Computer Networking
Diploma in Information Technology

17. THE FOLLOWING DIPLOMA EXTENDED CURRICULUM PROGRAMMES (ECPs) ARE OFFERED IN THE FACULTY:

Diploma in Computer Networking (ECP)
Diploma in Information Technology (ECP)

18. THE FOLLOWING ADVANCED DIPLOMA PROGRAMME IS OFFERED IN THE FACULTY:

Advanced Diploma in Logistics and Transportation Management

19. THE FOLLOWING BACCALAUREUS TECHNOLOGIAE PROGRAMMES ARE OFFERED IN THE FACULTY: ***(Phasing out. Preliminary planned last new intake in the first semester of 2019.)***

Baccalaureus Technologiae: Construction Management
Baccalaureus Technologiae: Engineering: Civil
Baccalaureus Technologiae: Engineering: Electrical
Baccalaureus Technologiae: Engineering: Mechanical
Baccalaureus Technologiae: Information Technology (Software Development)
Baccalaureus Technologiae: Information Technology (Web and Application Development)
Baccalaureus Technologiae: Quantity Surveying

20. THE FOLLOWING BACHELOR OF SCIENCE PROGRAMME IS OFFERED IN THE FACULTY:

Bachelor of Science in Hydrology and Water Resources Management

21. THE FOLLOWING BACHELOR OF ENGINEERING TECHNOLOGY PROGRAMMES ARE OFFERED IN THE FACULTY: ***(First first-year intake in 2018.)***

Bachelor of Construction in Construction Management
Bachelor of Construction in Quantity Surveying
Bachelor of Engineering Technology in Civil Engineering
Bachelor of Engineering Technology in Mechanical Engineering

22. THE FOLLOWING MAGISTER TECHNOLOGIAE PROGRAMMES ARE OFFERED IN THE FACULTY:

Magister Technologiae: Engineering: Civil *(Phasing out)*
Magister Technologiae: Engineering: Electrical *(Phasing out)*
Magister Technologiae: Engineering: Mechanical *(Phasing out)*
Magister Technologiae: Information Technology *(Phasing out)*

23. THE FOLLOWING MASTER'S DEGREE PROGRAMMES ARE OFFERED IN THE FACULTY:

Master of Engineering in Civil Engineering
Master of Engineering in Electrical Engineering
Master of Engineering in Mechanical Engineering
Master of Information Technology

24. THE FOLLOWING DOCTOR TECHNOLOGIAE PROGRAMMES ARE OFFERED IN THE FACULTY:

Doctor Technologiae: Engineering: Civil *(Phasing out)*
Doctor Technologiae: Engineering: Electrical *(Phasing out)*
Doctor Technologiae: Engineering: Mechanical *(Phasing out)*
Doctor Technologiae: Information Technology *(Phasing out)*

25. THE FOLLOWING DOCTORAL PROGRAMMES ARE OFFERED IN THE FACULTY:

Doctor of Engineering in Civil Engineering
Doctor of Engineering in Electrical Engineering
Doctor of Engineering in Mechanical Engineering

26. THE FOLLOWING DOCTOR OF PHILOSOPHY PROGRAMME IS OFFERED IN THE FACULTY:

Doctor of Philosophy in Information Technology

27. HIGHER CERTIFICATES

27.1 HIGHER CERTIFICATE IN CONSTRUCTION HC_CON

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 140
MINIMUM CREDITS REQUIRED: 140
HEMIS CREDITS: 1.000
NQF LEVEL: 5
DURATION OF LEARNING PROGRAMME: 1 year full-time or 2 years part-time

Instructional offerings

1ST YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
CET00BE	Construction and the Environment	15	
COM00BE	Construction Management	20	
CMT00BE	Construction Mathematics	15	
CTG00BE	Construction Technology	20	
FCL00BE	Fundamentals of Contract Law	15	
FHD00BE	Fundamentals of Human Settlement Development	15	
MET00BE	Measurement, Estimating and Tendering	20	
PBS00BE	Physical Building Science	15	
SES00BE	Site Establishment and Supervision	20	
	Total:	**140**	

REMARKS

- All instructional offerings are compulsory.
- Any application for subject recognition will be considered ONLY for subjects completed at equivalent level, not at a lower level.
- The qualification will be issued upon completion of 140 credits.
- One intake per year, in January.
- After successful completion of this qualification, the Higher Certificate will be conferred during an official graduation ceremony of CUT.

Admission requirements:

For candidates who matriculated in 2007 and before:
A Grade 12 National Senior Certificate with a minimum score of 27 on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in both Physical Sciences and Mathematics. Candidates with a score of 23 to 26 on the CUT scoring scale must successfully complete the selection process for admission, which could include the writing of an admission selection test. Mathematical Literacy will **not** be accepted.

For candidates who matriculated in 2008 and thereafter:
A National Senior Certificate with a score of 27 on the CUT scoring scale, plus a minimum pass mark of 50% (rating 4) in both Mathematics and Physical Sciences. Candidates with a score of 23 to 26 on the CUT scoring scale must successfully complete the selection process for admission, which could include the writing of an admission selection test. Mathematical Literacy will **not** be accepted.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

27.2 HIGHER CERTIFICATE IN RENEWABLE ENERGY TECHNOLOGIES IEHCRE

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 120
MINIMUM CREDITS REQUIRED: 120
HEMIS CREDITS: 1.000
NQF LEVEL: 5
DURATION OF LEARNING PROGRAMME: 1 year

Instructional offerings

1ST YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
LCS5001		Academic Literacy and Communication Studies	12	
PPE5011		Applied Physics of Energy Conversion I	12	
DLC5011		Basic Digital Literacy	6	
EEN5011		Electrical Engineering I	12	
WIS5011		Mathematics IA	6	
LES5011		Solar Energy Systems I	12	
	EIP5012	Electrical Installation and Storage	12	
	HPP5012	Health and Safety: Principles and Practice	6	
	WIS5012	Mathematics IB	6	
	PGS5012	Power Generation and Storage	12	
	LES5022	Solar Energy Systems II	12	
	LWG5012	Small-wind Generation	12	
		Total:	**120**	

REMARKS

- All instructional offerings are compulsory.
- Any application for subject recognition will be considered ONLY for subjects completed at equivalent level, not at a lower level.
- The qualification will be issued upon completion of 120 credits.
- One intake per year, in January.
- After successful completion of this qualification, the Higher Certificate will be conferred during an official graduation ceremony of CUT.

Admission requirements:

For candidates who matriculated in 2007 and before:
A Grade 12 National Senior Certificate with a minimum score of 27 on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in both Physical Sciences and Mathematics. Candidates with a score of 23 to 26 on the CUT scoring scale must successfully complete

the selection process for admission, which could include the writing of an admission selection test. Mathematical Literacy will **not** be accepted.

For candidates who matriculated in 2008 and thereafter:
A National Senior Certificate with a score of 27 on the CUT scoring scale, plus a minimum pass mark of 50% (rating 4) in both Mathematics and Physical Sciences. Candidates with a score of 23 to 26 on the CUT scoring scale must successfully complete the selection process for admission, which could include the writing of an admission selection test. Mathematical Literacy will **not** be accepted.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

28. NATIONAL DIPLOMAS

28.1 NATIONAL DIPLOMA: BUILDING ISNDBO

(No new first-year intake for the National Diploma: Building as from 2018. This programme will be phased out.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 360
MINIMUM CREDITS REQUIRED: 360
HEMIS CREDITS: 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 3 years

Instructional offerings

1ST YEAR	2ND YEAR	3RD YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
TBW10AI			Applied Building Science I	20	
ECM12BI			Communication Skills I **(Semester 2)**	5	
RTP11AI			Computer Applications I **(Semester 1)**	5	
KON10AI			Construction Management I	20	
KTG10AI			Construction Technology I	20	
PRE1A			English Proficiency **and**		
PRE2B			English Proficiency	10	
PIM5011			Personal Information Management	0	
RSK11AB			Reading Skills	0	
BRK10AI			Quantity Surveying I	20	
TRO10AI			Site Surveying I	20	
	TBW20ZI		Work-integrated Learning: Building	60	
	KON20AI		Construction Management II	20	
	KTG20AI		Construction Technology II	20	
	BRK20AI		Quantity Surveying II	20	

1ST YEAR	2ND YEAR	3RD YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
		KOR30AI	Construction Accounting III	20	
		KON30AI	Construction Management III	20	
		KTG30AI	Construction Technology III	20	
		PRY30AI	Price Analysis and Estimating III	20	
		BRK30AI	Quantity Surveying III	20	
		STR30AI	Structures and Concrete III	20	
			Total:	**360**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Applied Building Science I	20	Grade 12
English Proficiency	10	
Communication Skills I (Semester 2)	5	Grade 12
Computer Applications I (Semester 1)	5	Grade 12
Construction Accounting III	20	Quantity Surveying I
Construction Management I	20	Grade 12
Construction Management II	20	Construction Management I
Construction Management III	20	Construction Management II
Construction Technology I	20	Grade 12
Construction Technology II	20	Construction Technology I
Construction Technology III	20	Construction Technology II
Price Analysis and Estimating III	20	Quantity Surveying I
Quantity Surveying I	20	Grade 12
Quantity Surveying II	20	Quantity Surveying I
Quantity Surveying III	20	Quantity Surveying II
Site Surveying I	20	Grade 12
Structures and Concrete III	20	Site Surveying I, Construction Technology II and Applied Building Science I
Work-integrated Learning	60	All first-year subjects

REMARKS

All instructional offerings are compulsory.

The minimum total credit value of theoretical instructional offerings is 240 SAQA credits (2 HEMIS credits). The work-integrated learning component, together with the project-based subjects of the second year, amounts to 120 SAQA credits.

Only one intake per year, in January.

After successful completion of this qualification, the National Diploma will be awarded during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. The following will apply to Academic Literacy and Communication Studies, and where a subject is denoted with an asterisk (*): A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Admission requirements:

For candidates who matriculated in 2007 and before:
A National Senior Certificate (NSC) with a score of 27 and higher on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in Mathematics. Physical Sciences is recommended.

For candidates who completed the NSC in 2008 and thereafter:
A National Senior Certificate with a score of 27 and higher on the CUT scoring scale, plus a minimum mark of 50% (rating 4) in Mathematics. Physical Sciences is recommended.

Students who do not fully comply with the stated admission requirements may be considered on the strength of their academic record, as well as the successful completion of a selection test, provided there is sufficient space available for admission.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

Students need to follow the curriculum as prescribed.

- The student is not permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level (see “prerequisites”).
- A student must be enrolled for all prescribed second-year instructional offerings simultaneously, unless credits have already been obtained for any of the prescribed instructional offerings.

28.2 NATIONAL DIPLOMA: ENGINEERING: CIVIL ISNDLS

(No new first-year intake for the National Diploma: Engineering: Civil as from 2018. This programme will be phased out.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**360**
MINIMUM CREDITS REQUIRED:	**360**
HEMIS CREDITS:	**3.000**
NQF LEVEL:	**6**
DURATION OF LEARNING PROGRAMME:	**3 years**

Statement of the purpose of the qualification:

The purpose of this qualification is to build the necessary knowledge, understanding and skills required for the student's progression towards becoming a competent practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

1ST YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1		SEMESTER 2				
January	July	January	July			
CAM11AI	CAM12AI			Applied Mechanics I	10	
COM11AI	COM12AI			Computer Skills I	5	
KMA11AI	KMA12AI			Construction Materials I	10	
CDR11AI	CDR12AI			Drawing I	10	
PRE1A				English Proficiency **and**		
PRE2B				English Proficiency	0	
	PRE2A			English Proficiency **and**		
	PRE1B			English Proficiency	0	
PIM5011	PIM5011			Personal Information Management	0	
RSK11AB	RSK11AB			Reading Skills	0	
CMC11AI	CMC12AI			Management (Civil) I	10	
WIS11AI	WIS12AI			Mathematics I	10	
		ECM11BI	ECM12BI	Communication Skills I	5	
		KMT11AI	KMT12AI	Construction Methods I	10	
		CDR21AI	CDR22AI	Drawing II	10	
		CMC21AI	CMC22AI	Management (Civil) II	10	
		WIS21AI	WIS22AI	Mathematics II	10	
		CSU11AI	CSU12AI	Surveying I	10	
		CTS21AI	CTS22AI	Theory of Structures II	10	
				Total:	**120**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
CGE21AI	CGE22AI			Geotechnical Engineering II	10	
SSL31AI	SSL32AI			Structural Steel and Timber Design III	10	
CSA21AI	CSA22AI			Structural Analysis II	10	
CSU21AI	CSU22AI			Surveying (Civil) II	10	
CTE21AI	CTE22AI			Transportation Engineering II	10	
CWE21AI	CWE22AI			Water Engineering II	10	
		CDO31AI	CDO32AI	Documentation III	10	
		CGE31AI	CGE32AI	Geotechnical Engineering III	10	
		GWP31AI	GWP32AI	Reinforced Concrete and Masonry Design III	10	
		CSA31AI	CSA32AI	Structural Analysis III	10	
		CTE31AI	CTE32AI	Transportation Engineering III	10	
		CWE31AI	CWE32AI	Water Engineering III	10	
				Total:	**120**	

3RD YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTERS 5 & 6				
January	**July**			
CEX11ZI	CEX12ZI	Work-integrated Learning I	60	
CEX21ZI	CEX22ZI	Work-integrated Learning II	60	
		Total:	**120**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Applied Mechanics I	10	Grade 12
Communication Skills I	5	Grade 12
Computer Skills I	5	Grade 12
Construction Materials I	10	Grade 12
Construction Methods I	10	Grade 12
Documentation III	10	Management (Civil) II
Drawing I	10	Grade 12
Drawing II	10	Drawing I and Computer Skills I
Geotechnical Engineering II	10	Construction Materials I
Geotechnical Engineering III	10	Geotechnical Engineering II
Management (Civil) I	10	Grade 12
Management (Civil) II	10	Management (Civil) I
Mathematics I	10	Grade 12
Mathematics II	10	Mathematics I
Reinforced Concrete and Masonry Design III	10	Theory of Structures II
Structural Analysis II	10	Theory of Structures II
Structural Analysis III	10	Structural Analysis II
Structural Steel and Timber Design III	10	Theory of Structures II
Surveying I	10	Mathematics I
Surveying (Civil) II	10	Surveying I
Theory of Structures II	10	Applied Mechanics I
Transportation Engineering II	10	Drawing II and Surveying I
Transportation Engineering III	10	Transportation Engineering II
Water Engineering II	10	Applied Mechanics I and Mathematics I
Water Engineering III	10	Applied Mechanics I, Mathematics I and Drawing I
Work-integrated Learning I	60	All first- and second-semester instructional offerings passed
Work-integrated Learning II	60	Work-integrated Learning I

REMARKS

All instructional offerings from semester 1 to 6 are compulsory.
The total credit value of all THEORETICAL instructional offerings **must** add up to 240 SAQA credits (2 HEMIS credits).
The total credit value for Work-integrated Learning is 120 SAQA credits.
The National Diploma will be issued upon completion of 360 credits.

Two intakes per year, in January and July. The final first-year Semester 1 intake for this programme was for the second semester of 2017. Students who enrolled for this programme in 2017 or earlier will be allowed to register for Semester 2, Semester 3, Semester 4, Work-integrated Learning I and Work-integrated Learning II in order to complete their National Diploma studies.

Semester 1 of 2018 will be the final opportunity to repeat failed Semester 1 subjects. Students who failed Semester 1 subjects during 2017 will be allowed to re-register for Semester 1 subjects only for Semester 1 of 2018.

Students who failed subjects and need to re-enrol for subjects are not allowed to enrol for subjects spanning more than two academic semesters. Students who must redo subjects may thus simultaneously enrol for Semester 1 and Semester 2, or Semester 2 and Semester 3, or Semester 3 and Semester 4 subjects.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Sills.

Admission requirements:

For candidates who matriculated in 2007 and before:
A National Senior Certificate (NSC) with a score of 27 and higher on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in both Physical Sciences and Mathematics.

For candidates who completed the NSC in 2008 and thereafter:
A National Senior Certificate with a score of 27 and higher on the CUT scoring scale, plus a minimum pass mark of 50% (rating 4) in both Mathematics and Physical Sciences. Mathematical Literacy will **not** be accepted.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

- The student is not permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level (see prerequisites).

28.3 NATIONAL DIPLOMA: ENGINEERING: COMPUTER SYSTEMS IENDCY

(No new first-year intake for the National Diploma: Engineering: Computer Systems as from 2018. This programme will be phased out.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**360**
MINIMUM CREDITS REQUIRED:	**360**
HEMIS CREDITS:	**3.000**
NQF LEVEL:	**6**
DURATION OF LEARNING PROGRAMME:	**3 years**

Statement of the purpose of the qualification:

The purpose of this qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

1ST YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1		SEMESTER 2				
January	July	January	July			
ECM11BI	ECM12BI			*Communication Skills I	5	
COM11AI	COM12AI			*Computer Skills I	5	
EDS11BI	EDS12BI			*Digital Systems I	10	
EEN11AI	EEN12AI			*Electrical Engineering I	10	
ELE11AI	ELE12AI			*Electronics I	10	
PRE1A				English Proficiency **and**		
PRE2B				English Proficiency	0	
	PRE2A			English Proficiency **and**		
	PRE1B			English Proficiency	0	
PIM5011	PIM5011			Personal Information Management	0	
RSK11AB	RSK11AB			Reading Skills	0	
WIS11AI	WIS12AI			*Mathematics I	10	
PRG11AI	PRG12AI			*Programming I	10	
		EDS21BI	EDS22BI	*Digital Systems II	10	
		ELE21AI	ELE22AI	*Electronics II	10	
		ENT21AI	ENT22AI	Entrepreneurship II	10	
		WIS21AI	WIS22AI	*Mathematics II	10	
		NET21AI	NET22AI	*Network Systems II	10	
		PRG21AI	PRG22AI	*Programming II	10	
				Total:	**120**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
EDS31BI	EDS32BI			*Digital Systems III	10	
ELA31BI	ELA32BI			*Electronics III	10	
WIT31AI	WIT32AI			Mathematical Applications III	10	
NET31AI	NET32AI			*Network Systems III	10	
PRG31AI	PRG32AI			*Programming III	10	
SYS21AI	SYS22AI			*Systems Analysis II	10	
		DAT31BI	DAT32BI	*Database Principles III	10	
		EDP31AI	EDP32AI	*Design Project III	10	
		LOG31BI	LOG32BI	*Logic Design III	10	
		MIP31BI	MIP32BI	Microprocessors III	10	
		OPT31AI	OPT32AI	*Operating Systems III	10	
		SOF31BI	SOF32BI	*Software Engineering III	10	
				Total:	**120**	

3RD YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTERS 5 & 6				
January	July			
EXP11ZI	EXP12ZI	*Work-integrated Learning I	60	
EXP21ZI	EXP22ZI	*Work-integrated Learning II	60	
		Total:	**120**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Communication Skills I	5	Grade 12
Computer Skills I	5	Grade 12
Database Principles III	10	Programming II
Design Project III	10	Electronics II, Digital Systems II, Programming II
Digital Systems I	10	Grade 12
Digital Systems II	10	Digital Systems I
Digital Systems III	10	Digital Systems II
Electrical Engineering I	10	Grade 12
Electronics I	10	Grade 12
Electronics II	10	Electronics I
Electronics III	10	Electronics II
Entrepreneurship II	10	Grade 12
Logic Design III	10	Digital Systems II
Mathematical Applications III	10	Mathematics II
Mathematics I	10	Grade 12
Mathematics II	10	Mathematics I
Microprocessors III	10	Digital Systems III
Network Systems II	10	Grade 12
Network Systems III	10	Network Systems II (CCNA1)
Operating Systems III	10	Network Systems III (CCNA2)
Programming I	10	Grade 12
Programming II	10	Programming I
Programming III	10	Programming II
Software Engineering III	10	Systems Analysis II
Systems Analysis II	10	Programming I
Work-integrated Learning I	60	Completion of all first- and second-semester instructional offerings
Work-integrated Learning II	60	Work-integrated Learning I and successful completion of all instructional offerings

REMARKS

*Compulsory instructional offerings.
The total credit value of all theoretical instructional offerings **must** add up to 240 SAQA credits (2 HEMIS credits).
The total credit value for Work-integrated Learning is 120 SAQA credits.
The National Diploma will be issued upon completion of 360 credits.

One intake per year, in January.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Admission requirements

For candidates who matriculated in 2007 and before:
A Grade 12 National Senior Certificate with a minimum score of 27 on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in both Physical Sciences and Mathematics. Candidates with a score of 23 to 26 on the CUT scoring scale must successfully complete the selection process for admission, which could include the writing of an admission selection test. Mathematical Literacy will **not** be accepted.

For candidates who matriculated in 2008 and thereafter:
A National Senior Certificate with a score of 27 on the CUT scoring scale, plus a minimum pass mark of 50% (rating 4) in both Mathematics and Physical Sciences. Candidates with a score of 23 to 26 on the CUT scoring scale must successfully complete the selection process for admission, which could include the writing of an admission selection test. Mathematical Literacy will **not** be accepted.
Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

- The student is not permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level.

28.4 NATIONAL DIPLOMA: ENGINEERING: ELECTRICAL (HC) IENDTS

(No new first-year intake for the National Diploma: Engineering: Electrical (HC) as from 2018. This programme will be phased out.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**360**
MINIMUM CREDITS REQUIRED:	**360**
HEMIS CREDITS:	**3.000**
NQF LEVEL:	**6**
DURATION OF LEARNING PROGRAMME:	**3 years**

Statement of the purpose of the qualification:

The purpose of the qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

1ST YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1		SEMESTER 2				
January	July	January	July			
ECM11BI	ECM12BI			*Communication Skills I	6	
COM11AI	COM12AI			*Computer Skills I	6	
EDS11BI	EDS12BI			Digital Systems I	12	
EEN11AI	EEN12AI			*Electrical Engineering I	12	
ELE11AI	ELE12AI			*Electronics I	12	
PRE1A				English Proficiency **and**		
PRE2B				English Proficiency	0	
	PRE2A			English Proficiency **and**		
	PRE1B			English Proficiency	0	
WIS11AI	WIS12AI			*Mathematics I	12	
PIM5011	PIM5011			Personal Information Management	0	
RSK11AB	RSK11AB			Reading Skills	0	
MEC11AI	MEC12AI			Mechanics I	12	
		EDS21BI	EDS22BI	Digital Systems II	12	
		EEN21AI	EEN22AI	*Electrical Engineering II	12	
		ELE21AI	ELE22AI	*Electronics II	12	
		WIS21AI	WIS22AI	*Mathematics II	12	
		EMD11AI	EMD12AI	Mechanical Technology I	12	
		EMJ21AI	EMJ22AI	Electrical Machines	12	
		MSM21AI	MSM22AI	Strength of Materials II	10	
		EPR11AI	EPR12AI	Projects I	12	
				Total:	**120**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
EDS31BI	EDS32BI			Digital Systems III	12	
EEN31AI	EEN32AI			Electrical Engineering III	12	
EMJ31AI	EMJ32AI			Electrical Machines III	12	
EKM21AI	EKM22AI			Electronic Communication II	12	
ELA31BI	ELA32BI			Electronics III	12	
EID21AI	EID22AI			Industrial Electronics II	12	
WIS31AI	WIS32AI			Mathematics III	12	
EMD21AI	EMD22AI			Mechanical Technology II	12	
EPR21AI	EPR22AI			Projects II	12	
MSM31BI	MSM32BI			Strength of Materials III	10	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
		MSK31AI	MSK32AI	Applied Strength of Materials III	10	
		ECN31BI	ECN32BI	Control Systems III	12	
		EDP31HI	EDP32HI	*Design Project III **(Heavy Current)**	12	
		EBE31AI	EBE32AI	Electrical Protection III	12	
		ELT31AI	ELT32AI	Electronic Applications III	12	
		LOG31BI	LOG32BI	Logic Design III	12	
		EMD31AI	EMD32AI	Mechanical Technology III	12	
		EPE31AI	EPE32AI	Power Electronics III	12	
		ERE31AI	ERE32AI	Radio Engineering III	12	
		ESO21AI	ESO22AI	Software Design II	12	
		EVE31AI	EVE32AI	Electrical Distribution III	12	
				Total:	**120**	

3RD YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTERS 5 & 6				
January	July			
EEX11ZI	EEX12ZI	*Work-integrated Learning I	60	
EEX21ZI	EEX22ZI	*Work-integrated Learning II	60	
		Total:	**120**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Applied Strength of Materials III	10	Strength of Materials III
Communication Skills I	6	Grade 12
Computer Skills I	6	Grade 12
Control Systems III	12	Mathematics III and Electronics II
Design Project III	12	Electronics II and Projects II, or Electrical Machines II and Electrical Engineering II
Digital Systems I	12	Grade 12
Digital Systems II	12	Digital Systems I
Digital Systems III	12	Digital Systems II
Electrical Distribution III	12	Electrical Engineering II
Electrical Engineering I	12	Grade 12
Electrical Engineering II	12	Electrical Engineering I
Electrical Engineering III	12	Electrical Engineering II
Electrical Machines II	12	Electrical Engineering I
Electrical Machines III	12	Electrical Machines II
Electrical Protection III	12	Electrical Engineering II and Electronics II
Electronic Applications III	12	Electronics III
Electronic Communication II	12	Electrical Engineering I and Electronics II

Electronics I	12	Grade 12
Electronics II	12	Electronics I
Electronics III	12	Electronics II
Industrial Electronics II	12	Electronics II and Mathematics II
Logic Design III	12	Digital Systems II
Mathematics I	12	Grade 12
Mathematics II	12	Mathematics I
Mathematics III	12	Mathematics II
Mechanical Technology I	12	Mechanics I
Mechanical Technology II	12	Mechanical Technology I
Mechanical Technology III	12	Mechanical Technology II
Mechanics I	12	Grade 12
Power Electronics III	12	Industrial Electronics II
Projects I	12	Electronics I
Projects II	12	Projects I and Electronics II
Radio Engineering III	12	Electronic Communication II
Software Design II	12	Computer Skills I
Strength of Materials II	10	Mechanics I
Strength of Materials III	10	Strength of Materials II
Work-integrated Learning I	60	Successful completion of all Semester1 and Semester 2 instructional offerings
Work-integrated Learning II	60	Work-integrated Learning I and successful completion of all instructional offerings

REMARKS

*Compulsory instructional offerings.
The total credit value of all theoretical instructional offerings **must** add up to 240 SAQA credits (2 HEMIS credits).
The total credit value for Work-integrated Learning is 120 SAQA credits.
The National Diploma will be issued upon completion of 360 SAQA credits.

At least 50 SAQA credits must be earned in third-level instructional offerings.

A maximum of 50 SAQA credits in any Engineering-related learning programme may be presented for Semesters 1 to 4.

Two intakes per year, in January and July.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Admission requirements

For candidates who matriculated in 2007 and before:
A Grade 12 National Senior Certificate with a minimum score of 27 on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in both Physical Sciences and Mathematics. Candidates with a score of 23 to 26 on the CUT scoring scale must successfully complete the selection process for admission, which could include the writing of an admission selection test. Mathematical Literacy will **not** be accepted.

For candidates who matriculated in 2008 and thereafter:
A National Senior Certificate with a score of 27 on the CUT scoring scale, plus a minimum pass mark of 50% (rating 4) in both Mathematics and Physical Sciences. Candidates with a score of 23 to 26 on the CUT scoring scale must successfully complete the selection process for admission, which could include the writing of an admission selection test. Mathematical Literacy will **not** be accepted.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

- The student is not permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level.

28.5 NATIONAL DIPLOMA: ENGINEERING: ELECTRICAL (ELECTRONIC LC) IENDLC

(No new first-year intake for the National Diploma: Engineering: Electrical (LC) as from 2018. This programme will be phased out.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**360**
MINIMUM CREDITS REQUIRED:	**360**
HEMIS CREDITS:	**3.000**
NQF LEVEL:	**6**
DURATION OF LEARNING PROGRAMME:	**3 years**

Statement of the purpose of the qualification:

The purpose of the qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

1ST YEAR				**INSTRUCTIONAL OFFERINGS**	**SAQA CREDITS**	**HEMIS CREDITS**
SEMESTER 1		**SEMESTER 2**				
January	**July**	**January**	**July**			
ECM11BI	ECM12BI			*Communication Skills I	6	
COM11AI	COM12AI			*Computer Skills I	6	
EDS11BI	EDS12BI			Digital Systems I	12	
EEN11AI	EEN12AI			*Electrical Engineering I	12	
ELE11AI	ELE12AI			*Electronics I	12	
PRE1A				English Proficiency **and**		
PRE2B				English Proficiency	0	
	PRE2A			English Proficiency **and**		
	PRE1B			English Proficiency	0	
PIM5011	PIM5011			Personal Information Management	0	
RSK11AB	RSK11AB			Reading Skills	0	
WIS11AI	WIS12AI			*Mathematics I	12	
		EDS21BI	EDS22BI	Digital Systems II	12	
		EEN21AI	EEN22AI	*Electrical Engineering II	12	
		ELE21AI	ELE22AI	*Electronics II	12	
		WIS21AI	WIS22AI	*Mathematics II	12	
		EPR11AI	EPR12AI	Projects I	12	
				Total:	**120**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
EDS31BI	EDS32BI			Digital Systems III	12	
EEN31AI	EEN32AI			Electrical Engineering III	12	
EKM21AI	EKM22AI			Electronic Communication II	12	
ELA31BI	ELA32BI			Electronics III	12	
WIS31AI	WIS32AI			Mathematics III	12	
EPR21AI	EPR22AI			Projects II	12	
		ECN31BI	ECN32BI	Control Systems III	12	
		EDP31LI	EDP32LI	*Design Project III **(Light Current)**	12	
		ELT31AI	ELT32AI	Electronic Applications III	12	
		LOG31BI	LOG32BI	Logic Design III	12	
		ERE31AI	ERE32AI	Radio Engineering III	12	
		ESO21AI	ESO22AI	Software Design II	12	
				Total:	**120**	

3RD YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTERS 5 & 6				
January	July			
EEX11ZI	EEX12ZI	*Work-integrated Learning I	60	
EEX21ZI	EEX22ZI	*Work-integrated Learning II	60	
		Total:	**120**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Applied Strength of Materials III	10	Strength of Materials III
Communication Skills I	6	Grade 12
Computer Skills I	6	Grade 12
Control Systems III	12	Mathematics III and Electronics II
Design Project III	12	Electronics II and Projects II, or Electrical Machines II and Electrical Engineering II
Digital Systems I	12	Grade 12
Digital Systems II	12	Digital Systems I
Digital Systems III	12	Digital Systems II
Electrical Distribution III	12	Electrical Engineering II
Electrical Engineering I	12	Grade 12
Electrical Engineering II	12	Electrical Engineering I
Electrical Engineering III	12	Electrical Engineering II
Electrical Machines II	12	Electrical Engineering I
Electrical Machines III	12	Electrical Machines II
Electrical Protection III	12	Electrical Engineering II and Electronics II
Electronic Applications III	12	Electronics III
Electronic Communication II	12	Electrical Engineering I and Electronics II

Electronics I	12	Grade 12
Electronics II	12	Electronics I
Electronics III	12	Electronics II
Industrial Electronics II	12	Electronics II and Mathematics II
Logic Design III	12	Digital Systems II
Mathematics I	12	Grade 12
Mathematics II	12	Mathematics I
Mathematics III	12	Mathematics II
Mechanical Technology I	12	Mechanics I
Mechanical Technology II	12	Mechanical Technology I
Mechanical Technology III	12	Mechanical Technology II
Mechanics I	12	Grade 12
Power Electronics III	12	Industrial Electronics II
Projects I	12	Electronics I
Projects II	12	Projects I and Electronics II
Radio Engineering III	12	Electronic Communication II
Software Design II	12	Computer Skills I
Strength of Materials II	10	Mechanics I
Strength of Materials III	10	Strength of Materials II
Work-integrated Learning I	60	Successful completion of all Semester 1 and Semester 2 instructional offerings
Work-integrated Learning II	60	Work-integrated Learning I and successful completion of all instructional offerings

REMARKS

*Compulsory instructional offerings.
The total credit value of all theoretical instructional offerings **must** add up to 240 SAQA credits (2 HEMIS credits).
The total credit value for Work-integrated Learning is 120 SAQA credits.
The National Diploma will be issued upon completion of 360 SAQA credits.

At least 50 SAQA credits must be earned in third-level instructional offerings.

A maximum of 50 SAQA credits in any Engineering-related learning programme may be presented for Semesters 1 to 4.

Two intakes per year, in January and July.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Admission requirements

For candidates who matriculated in 2007 and before:
A Grade 12 National Senior Certificate with a minimum score of 27 on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in both Physical Sciences and Mathematics. Candidates with a score of 23 to 26 on the CUT scoring scale must successfully complete the selection process for admission, which could include the writing of an admission selection test. Mathematical Literacy will **not** be accepted.

For candidates who matriculated in 2008 and thereafter:
A National Senior Certificate with a score of 27 on the CUT scoring scale, plus a minimum pass mark of 50% (rating 4) in both Mathematics and Physical Sciences. Candidates with a score of 23 to 26 on the CUT scoring scale must successfully complete the selection process for admission, which could include the writing of an admission selection test. Mathematical Literacy will **not** be accepted.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

- The student is not permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level.

28.6 NATIONAL DIPLOMA: ENGINEERING: MECHANICAL IMNDNG

(No new first-year intake for the National Diploma: Engineering: Mechanical as from 2018. This programme will be phased out.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**360**
MINIMUM CREDITS REQUIRED:	**360**
HEMIS CREDITS:	**3.000**
NQF LEVEL:	**6**
DURATION OF LEARNING PROGRAMME:	**3 years**

Statement of the purpose of the qualification:

The purpose of the qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

1ST YEAR				**INSTRUCTIONAL OFFERINGS**	**SAQA CREDITS**	**HEMIS CREDITS**
SEMESTER 1		**SEMESTER 2**				
January	**July**	**January**	**July**			
EMC11BI	EMC12BI			Communication Skills I	10	
RPV11AI	RPV12AI			Computer and Programming Skills I	10	
PRE1A PRE2B				English Proficiency **and** English Proficiency	0	
	PRE1A PRE2B			English Proficiency **and** English Proficiency	0	
PIM5011	PIM5011			Personal Information Management	0	
RSK11AB	RSK11AB			Reading Skills	0	
WIS11AI	WIS12AI			Mathematics I	10	
MDR11AI	MDR12AI			Mechanical Engineering Drawing I	10	
MAN11AI	MAN12AI			Mechanical Manufacturing Engineering I	10	
MEC11AI	MEC12AI			Mechanics I	10	
		MEL11AI	MEL12AI	Electrotechnology I	10	
		MFM21AI	MFM22AI	Fluid Mechanics II	10	
		WIS21AI	WIS22AI	Mathematics II	10	
		MEM21AI	MEM22AI	Mechanics of Machines II	10	
		MSM21AI	MSM22AI	Strength of Materials II	10	
		MTH21AI	MTH22AI	Thermodynamics II	10	
				Total:	**120**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
MFM31BI	MFM32BI			Fluid Mechanics III	10	
WIS31AI	WIS32AI			Mathematics III	10	
MED21AI	MED22AI			Mechanical Engineering Design II	10	
MEM31BI	MEM32BI			Mechanics of Machines III	10	
MSM31BI	MSM32BI			Strength of Materials III	10	
MTB31BI	MTB32BI			Thermodynamics III	10	
		MSK31AI	MSK32AI	Applied Strength of Materials III	10	
		MEL21AI	MEL22AI	Electrotechnology II	10	
		MHM31AI	MHM32AI	Hydraulic Machines III	10	
		MED31BI	MED32BI	Mechanical Engineering Design III	10	
		MST31AI	MST32AI	Steam Plant III	10	
		MTM31AI	MTM32AI	Theory of Machines III	10	
				Total:	**120**	

3RD YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTERS 5 & 6				
January	July			
MEX11ZI	MEX12ZI	Work-integrated Learning I	60	
MEX21ZI	MEX22ZI	Work-integrated Learning II	60	
		Total:	**120**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Applied Strength of Materials III	10	Strength of Materials III
Communication Skills I	10	Grade 12
Computer and Programming Skills I	10	Grade 12
Electrotechnology I	10	Grade 12
Electrotechnology II	10	Electrotechnology I
Fluid Mechanics II	10	Mechanics I
Fluid Mechanics III	10	Fluid Mechanics II
Hydraulic Machines III	10	Fluid Mechanics III
Mathematics I	10	Grade 12
Mathematics II	10	Mathematics I
Mathematics III	10	Mathematics II
Mechanical Engineering Design II	10	Mechanics I
Mechanical Engineering Design III	10	Mechanical Engineering Design II
Mechanical Engineering Drawing I	10	Grade 12
Mechanical Manufacturing Engineering I	10	Grade 12
Mechanics I	10	Grade 12
Mechanics of Machines II	10	Mechanics I
Mechanics of Machines III	10	Mechanics of Machines II

Steam Plant III	10	Thermodynamics III
Strength of Materials II	10	Mechanics I
Strength of Materials III	10	Strength of Materials II
Theory of Machines III	10	Mechanics of Machines III
Thermodynamics II	10	Mechanics I
Thermodynamics III	10	Thermodynamics II
Work-integrated Learning I	60	Successful completion of all Semesters 1 to 4 instructional offerings
Work-integrated Learning II	60	Work-integrated Learning I

REMARKS

The total credit value of all theoretical instructional offerings **must** add up to 240 SAQA credits (2 HEMIS credits).
The total credit value for Work-integrated Learning is 120 SAQA credits (1 HEMIS credit).
The National Diploma will be issued upon completion of 360 SAQA credits.
A maximum of 50 SAQA credits (0.5 HEMIS credits) may be earned in a selection of suitable instructional offerings from any other Engineering-related learning programme approved by Faculty Management.
At least 50 SAQA credits (0.5 HEMIS credits) must be earned in the third-year level instructional offerings.

Two intakes per year, in January and July.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Students may not simultaneously enrol for subjects spanning more than two academic semesters. For example: A student may enrol for Semester 2 and Semester 3 subjects simultaneously, but may then not enrol for any Semester 1 or Semester 4 subjects.

Students may not enrol for subjects involving timetable clashes.

Admission requirements

<u>For candidates who matriculated in 2007 and before</u>:
A National Senior Certificate with a score of 27 or higher on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in both Physical Sciences and Mathematics.

For candidates who matriculated in 2008 and thereafter:
A National Senior Certificate with a score of 27 or higher on the CUT scoring scale, plus a minimum pass mark of 50% (rating 4) in Mathematics, Physical Sciences and English. Mathematical Literacy will **not** be accepted.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

- The student is not permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level.

28.7 NATIONAL DIPLOMA: INFORMATION TECHNOLOGY (SOFTWARE DEVELOPMENT) EINDSD

(No new first-year intake for the National Diploma: Information Technology (Software Development) as from 2017. This programme will be phased out.)

This learning programme will be offered in Bloemfontein and Welkom.

SAQA CREDITS: 360
MINIMUM CREDITS REQUIRED: 360
HEMIS CREDITS: 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 3 years

Instructional offerings

1ST YEAR	2ND YEAR	3RD YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
~~OPG10BB~~			~~Development Software I~~	~~30~~	
~~PRE1A~~ ~~PRE2B~~			~~English Proficiency~~ **~~and~~** ~~English Proficiency~~	~~9~~ ~~9~~	
~~INL10DB~~ ~~ITV10AB~~			~~Information Systems I~~ ~~Information Technology Skills I~~	~~30~~ ~~30~~	
~~ITW10AB~~			~~IT Mathematics I~~	~~30~~	
~~PIM5011~~ ~~RSK11AB~~			~~Personal Information Management~~ ~~Reading Skills~~	~~0~~ ~~0~~	
	~~OPG20BB~~		~~Development Software II~~	~~30~~	
	~~INL20DB~~ ~~TPG10AB~~ ~~SPG11AB~~		~~Information Systems II~~ ~~Technical Programming I~~ ~~System Software I~~ **~~(Semester 1)~~**	~~30~~ ~~30~~ ~~15~~	
	~~SPG12AB~~	 OPG30BB INL30EB	~~System Software I~~ **~~(Semester 2)~~** Development Software III Information Systems III	~~15~~ 30 30	
		TPG20AB	Technical Programming II	30	
		SPG21CB GID10AB	System Software II **(Semester 1) or** Graphical User Interface Design I	15 30	
		SPG22CB GID10AB	System Software II **(Semester 2) or** Graphical User Interface Design I	15 30	
			Total:	**369**	

REMARKS

16 theoretical instructional offerings are to be taken over a period of three years.
The National Diploma will be issued upon completion of 360 SAQA credits.

Only one intake per year, in January.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Optional instructional offerings

Refer to the optional instructional offerings listed under "instructional offerings".

Admission requirements

Admission to this learning programme is subject to selection.

For candidates who matriculated in 2007 and before:
A Grade 12 National Senior Certificate (NSC) with a score of 27 on the CUT scoring scale, plus a minimum mark of 60% on standard grade or 40% on higher grade in Mathematics or Computer Science. A candidate must also successfully complete the selection process for admission.

For candidates who completed the NSC in 2008 and thereafter:
A National Senior Certificate with a score of 27 on the CUT scoring scale, plus a minimum pass mark of 40% (rating 3) in Mathematics or Computer Science, or 60% (rating 5) in Mathematical Literacy.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

Refer to the heading "General" under point 12 of this chapter.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order.

A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Instructional offerings	**Credits**	**Prerequisite instructional offerings**
Development Software I	30	Grade 12
English Proficiency	9	Grade 12
Information Systems I	30	Grade 12
Information Technology Skills I	30	Grade 12

IT Mathematics I	30	Grade 12
Development Software II	30	Development Software I
Information Systems II	30	Development Software I and Information Systems I
Technical Programming I	30	Development Software I
System Software I (Semester 1)	15	Information Systems I
System Software I (Semester 2)	15	System Software I (Semester 1)
Development Software III	30	Development Software II
Information Systems III	30	Information Systems II
Technical Programming II	30	Technical Programming I
System Software II (Semester 1)	15	System Software I (Semester 2)
System Software II (Semester II)	15	System Software II (Semester 1)
Graphical User Interface Design I	30	Development Software I

28.8 NATIONAL DIPLOMA: INFORMATION TECHNOLOGY (WEB AND APPLICATION DEVELOPMENT) BCNDIA

(No new first-year intake for the National Diploma: Information Technology (Web and Application Development) as from 2017. This programme will be phased out.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 360
MINIMUM CREDITS REQUIRED: 360
HEMIS CREDITS: 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 3 years

Instructional offerings

1ST YEAR	2ND YEAR	3RD YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
~~OPG10BB~~			~~Development Software I~~	~~30~~	
~~PRE1A~~			~~English Proficiency~~ **~~and~~**	~~9~~	
~~PRE2B~~			~~English Proficiency~~	~~9~~	
~~INL10DB~~			~~Information Systems I~~	~~30~~	
~~ITV10AB~~			~~Information Technology Skills I~~	~~30~~	
~~ITW10AB~~			~~IT Mathematics I~~	~~30~~	
~~PIM5011~~			~~Personal Information Management~~	~~0~~	
~~RSK11AB~~			~~Reading Skills~~	~~0~~	
	~~INP20AB~~		~~Internet Programming II~~	~~30~~	
	~~INL20DB~~		~~Information Systems II~~	~~30~~	
	~~WEB20AB~~		~~Web Management II~~	~~30~~	
	~~SPG11AB~~		~~Systems Software I~~ **~~(Semester 1)~~**	~~15~~	
	~~SPG12AB~~		~~Systems Software I~~ **~~(Semester 2)~~**	~~15~~	
		INP30AB	Internet Programming III	30	
		INL30EB	Information Systems III	30	
		WEB30AB	Web Management III	30	
		GID10AB	Graphical User Interface Design I	30	
			Total:	**369**	

REMARKS

16 theoretical instructional offerings are to be taken over a period of three years.

The National Diploma will be issued upon completion of 360 SAQA credits.

Only one intake per year, in January.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Admission requirements

Admission to this learning programme is subject to selection.

For candidates who matriculated in 2007 and before:
A Grade 12 National Senior Certificate (NSC) with a score of 27 on the CUT scoring scale, plus a minimum mark of 60% on standard grade or 40% on higher grade in Mathematics or Computer Science. A candidate must also successfully complete the selection process for admission.

For candidates who completed the NSC in 2008 and thereafter:
A National Senior Certificate with a score of 27 on the CUT scoring scale, plus a minimum pass mark of 40% (rating 3) in either Mathematics or Information Technology, or 60% (rating 5) in Mathematical Literacy.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements approved by Senate.

Optional instructional offerings

Refer to the optional instructional offerings listed under “instructional offerings”.

PREREQUISITES

Refer to the heading “General” under point 12 of this chapter.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order.

A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Instructional offerings	Credits	Prerequisite instructional offerings
Development Software I	30	Grade 12
English Proficiency	9	Grade 12
Information Systems I	30	Grade 12
Information Technology Skills I	30	Grade 12
IT Mathematics I	30	Grade 12
Internet Programming II	30	Development Software I
Information Systems II	30	Development Software I and Information Systems I
Web Management II	30	Development Software I
System Software I (Semester 1)	15	Information Systems I
System Software I (Semester 2)	15	System Software I (Semester 1)
Information Systems III	30	Information Systems II
Internet Programming III	30	Internet Programming II
Web Management III	30	Web Management II
Graphical User Interface Design I	30	Development Software I

29. NATIONAL DIPLOMAS: EXTENDED CURRICULUM PROGRAMMES (ECPs)

29.1 NATIONAL DIPLOMA: ENGINEERING: CIVIL ECP EXNDCE

(No new first-year intake for the National Diploma: Engineering: Civil ECP as from 2017. This programme will be phased out.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 360
MINIMUM CREDITS REQUIRED: 390
HEMIS CREDITS: 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 4 years

Statement of the purpose of the qualification:

The purpose of this qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and professional recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;

- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

1ST YEAR				**INSTRUCTIONAL OFFERINGS**	**SAQA CREDITS**	**HEMIS CREDITS**
SEMESTER 1		**SEMESTER 2**				
January	**July**	**January**	**July**			
ECM11BI	ECM12BI			Communication Skills I	5	
COM11AI	COM12AI			Computer Skills	5	
PRE1A PRE2B				English Proficiency **and** English Proficiency	0	
	PRE2B PRE1A			English Proficiency **and** English Proficiency	0	
INX01CP	INX02CP			Industrial Experience	6	
LSS01CP WIS01CP	LSS02CP WIS02CP			Life Skills Mathematics	4 10	
FIS01CP	FIS02CP			Physics	10	
PIM5011 RSK11AB	PIM5011 RSK11AB			Personal Information Management Reading Skills	0 0	
		CAM11AI KMA11AI CDR11AI	CAM12AI KMA12AI CDR12AI	Applied Mechanics I Construction Materials I Drawing I	10 10 10	
		CMC11AI WIS11AI	CMC12AI WIS12AI	Management (Civil) I Mathematics I	10 10	
				Total:	**90**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
KMT11AI	KMT12AI			Construction Methods I	10	
CDR21AI	CDR22AI			Drawing II	10	
CMC21AI	CMC22AI			Management (Civil) II	10	
WIS21AI	WIS22AI			Mathematics II	10	
CSU11AI	CSU12AI			Surveying I	10	
		CGE21AI	CGE22AI	Geotechnical Engineering II	10	
		CSU21AI	CSU22AI	Surveying (Civil) II	10	
		CTS21AI	CTS22AI	Theory of Structures II	10	
		CTE21AI	CTE22AI	Transportation Engineering II	10	
		CWE21AI	CWE22AI	Water Engineering II	10	
				Total:	**100**	

3RD YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 5		SEMESTER 6				
January	July	January	July			
CDO31AI	CDO32AI			Documentation III	10	
CGE31AI	CGE32AI			Geotechnical Engineering III	10	
SSL31AI	SSL32AI			Structural Steel and Timber Design III	10	
CSA21AI	CSA22AI			Structural Analysis II	10	
		GWP31AI	GWP32AI	Reinforced Concrete and Masonry Design III	10	
		CSA31AI	CSA32AI	Structural Analysis III	10	
		CTE31AI	CTE32AI	Transportation Engineering III	10	
		CWE31AI	CWE32AI	Water Engineering III	10	
				Total:	**80**	

4TH YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTERS 7 & 8				
January	July			
CEX11ZI	CEX12ZI	Work-integrated Learning I	60	
CEX21ZI	CEX22ZI	Work-integrated Learning II	60	
		Total:	**120**	

REMARKS

- All instructional offerings from Semesters 1 to 8 are compulsory.
- The minimum total credit value of all theoretical instructional offerings **must** add up to 240 SAQA credits (2 HEMIS credits).
- The total credit value for Work-integrated Learning is 120 SAQA credits.
- The National Diploma will be issued upon completion of 360 SAQA credits.
- Two intakes per year, in January and July.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order.

A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Admission requirements

For candidates who matriculated in 2007 and before:

- A Grade 12 National Senior Certificate with a score of 22 to 26 on the CUT scoring scale, plus a minimum mark of 45% on standard grade or 40% on higher grade in both Physical Sciences and Mathematics. A candidate must also successfully complete the selection process for admission.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2007 or before.

For candidates who matriculated in 2008 and thereafter:

- Candidates with a Grade 12 National Senior Certificate and a minimum score of 22 to 26 points on the CUT scoring scale, plus a minimum mark of 40% to 49% (level 3) in both Mathematics and Physical Sciences, may be admitted directly to the ECP. Mathematical Literacy will not be accepted in any of the Engineering disciplines.
- Candidates with a Grade 12 National Senior Certificate and a minimum score of 22 to 26 points on the CUT scoring scale, plus a minimum mark of 50% (rating 4) in both Mathematics and Physical Sciences, may also be required to undergo a selection test. Should the candidate pass the selection test, the applicant will be admitted to the mainstream programme. Mathematical Literacy will not be accepted in any of the Engineering disciplines.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2008 or thereafter.
- Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate. Candidates must also adhere to the general admission regulations for candidates who completed the N3, N4, N5 and N6 qualification at a Technical Vocational Education and Training (TVET) college.

PREREQUISITES

- A student will not be permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level.
- The student must pass all instructional offerings of the first semester of the extended curriculum in order to continue with his/her studies.

Instructional offerings	Credits	Prerequisite instructional offerings
Applied Mechanics I	10	Grade 12
Communication Skills I	5	Grade 12
Computer Skills I	5	Grade 12
Construction Materials I	10	Grade 12
Construction Methods I	10	Grade 12
Documentation III	10	Management (Civil) II
Drawing I	10	Grade 12
Drawing II	10	Drawing I and Computer Skills I
Geotechnical Engineering II	10	Construction Materials I
Geotechnical Engineering III	10	Geotechnical Engineering II
Industrial Experience 0	6	Grade 12
Life Skills 0	4	Grade 12
Management (Civil) I	10	Grade 12
Management (Civil) II	10	Management (Civil) I
Mathematics 0	10	Grade 12 Mathematics
Mathematics I	10	Mathematics 0
Mathematics II	10	Mathematics I
Physics 0	10	Grade 12 Physical Sciences
Reinforced Concrete and Masonry Design III	10	Theory of Structures II
Structural Analysis II	10	Theory of Structures II
Structural Analysis III	10	Structural Analysis II
Structural Steel and Timber Design III	10	Theory of Structures II
Surveying I	10	Mathematics I
Surveying (Civil) II	10	Surveying I
Theory of Structures II	10	Applied Mechanics I
Transportation Engineering II	10	Drawing II and Surveying I
Transportation Engineering III	10	Transportation Engineering II
Water Engineering II	10	Applied Mechanics I and Mathematics I
Water Engineering III	10	Applied Mechanics I, Mathematics I, and Drawing I
Work-integrated Learning I	60	Successful completion of all Semester 1, Semester 2 and Semester 3 instructional offerings
Work-integrated Learning II	60	Work-integrated Learning I

29.2 NATIONAL DIPLOMA: ENGINEERING: ELECTRICAL (HEAVY CURRENT) ECP EXNDEL

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**360**
MINIMUM CREDITS REQUIRED:	**380**
HEMIS CREDITS	**3.000**
NQF LEVEL:	**6**
DURATION OF LEARNING PROGRAMME:	**4 years**

Statement of the purpose of the qualification:

The purpose of the qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and professional recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering (Electrical Engineering);
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings:

1ST YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1		SEMESTER 2				
January	July	January	July			
ECM11BI	ECM12BI			*Communication Skills I	5	
COM11AI	COM12AI			*Computer Skills	5	
PRE1A PRE2B				English Proficiency **and** English Proficiency	0	
	PRE2B PRE1A			English Proficiency **and** English Proficiency	0	
INX01CP	INX02CP			Industrial Experience	6	
LSS01CP	LSS02CP			Life Skills	4	
WIS01CP	WIS02CP			Mathematics	10	
FIS01CP	FIS02CP			Physics	10	
PIM5011	PIM5011			Personal Information Management	0	
RSK11AB	RSK11AB			Reading Skills	0	
		EDS11BI	EDS12BI	Digital Systems I	10	
		EEN11AI	EEN12AI	*Electrical Engineering I	10	
		ELE11AI	ELE12AI	*Electronics I	10	
		WIS11AI	WIS12AI	*Mathematics I	10	
		MEC11AI	MEC12AI	Mechanics I	10	
				Total:	**50**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
EDS21BI	EDS22BI			Digital Systems II	10	
EEN21AI	EEN22AI			*Electrical Engineering II	10	
ELE21AI	ELE22AI			*Electronics II	10	
WIS21AI	WIS22AI			*Mathematics II	10	
EMD11AI	EMD12AI			Mechanical Technology I	10	
EPR11AI	EPR12AI			Projects 1	10	
		EDS31BI	EDS32BI	Digital Systems III	10	
		EEN31AI	EEN32AI	Electrical Engineering III	10	
		ELA31BI	ELA32BI	Electronics III	10	
		WIS31AI	WIS32AI	Mathematics III	10	
		EMJ21AI	EMJ22AI	Electrical Machines II	10	
		MSM21AI	MSM22AI	Strength of Materials II	10	
				Total:	**100**	

3RD YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 5		SEMESTER 6				
January	July	January	July			
EVE31AI	EVE32AI			Electrical Distribution III	10	
EMJ31AI	EMJ32AI			Electrical Machines III	10	
ELT31AI	ELT32AI			Electronic Applications III	10	
EKM21AI	EKM22AI			Electronic Communication II	10	
EID21AI	EID22AI			Industrial Electronics II	10	
LOG31BI	LOG32BI			Logic Design III	10	
EMD21AI	EMD22AI			Mechanical Technology II	10	
EPR21AI	EPR22AI			Projects II	10	
MSM31BI	MSM32BI			Strength of Materials III	10	
		MSK31AI	MSK32AI	Applied Strength of Materials III	10	
		ECN31BI	ECN32BI	Control Systems III	10	
		EDP31HI	EDP32HI	*Design Project III **(Heavy Current)**	10	
		EBE31AI	EBE32AI	Electrical Protection III	10	
		EMD31AI	EMD32AI	Mechanical Technology III	10	
		EPE31AI	EPE32AI	Power Electronics III	10	
		ERE31AI	ERE32AI	Radio Engineering III	10	
		ESO21AI	ESO22AI	Software Design II	10	
		EVE31AI	EVE32AI	Electrical Distribution III	10	
				Total:	**80**	

4TH YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTERS 7 & 8				
January	July			
EEX11ZI	EEX12ZI	Work-integrated Learning I	60	
EEX21ZI	EEX22ZI	Work-integrated Learning II	60	
		Total:	**120**	

REMARKS

- All instructional offerings indicated with an asterisk (*) are compulsory.
- The minimum total credit value of all theoretical instructional offerings **must** add up to 240 SAQA credits (2 HEMIS credits).
- The total credit value for Work-integrated Learning is 120 SAQA credits.
- The National Diploma will be issued upon completion of 360 SAQA credits, which **may** include a maximum of 50 SAQA credits (0.5 HEMIS credits) from any Engineering-related learning programme. It **must**, however, include a minimum of 50 SAQA credits (0.5 HEMIS credits) of formal time at level III.
- Two intakes per year, in January and July.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Admission requirements

For candidates who matriculated in 2007 and before:

- A Grade 12 National Senior Certificate with a score of 22 to 26 on the CUT scoring scale, plus a minimum mark of 45% on standard grade in both Physical Sciences and Mathematics. A candidate must also successfully complete the selection process for admission.
- Candidates must adhere to the general admission regulations for candidates who matriculated in 2007 or before.

For candidates who matriculated in 2008 and thereafter:

- Candidates with a Grade 12 National Senior Certificate with a minimum score of 22 to 26 points on the CUT scoring scale, plus a minimum mark of 40 to 49% (level 3) in both Mathematics and Physical Sciences, may be admitted directly to the ECP. Mathematical Literacy will not be accepted in any of the Engineering disciplines.
- Candidates with a Grade 12 National Senior Certificate with a minimum score of 22 to 26 points on the CUT scoring scale, plus a minimum mark of 50% (rating 4) in both Mathematics and Physical Sciences, may also be required to undergo a selection test. Should the candidate pass the selection test, the applicant will be admitted to the mainstream programme. Mathematical Literacy will not be accepted in any of the Engineering disciplines.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2008 or thereafter.
- Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate. Candidates must also adhere to the general admission regulations for candidates who completed the N3, N4, N5 and N6 qualification at a Technical Vocational Education and Training (TVET) college.

PREREQUISITES

- A student will not be permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level.
- The student must pass all instructional offerings of the first semester of the extended curriculum in order to continue with his/her studies.

Instructional offerings	**Credits**	**Prerequisite instructional offerings**
Communication Skills I	5	Grade 12
Computer Skills I	5	Grade 12
Control Systems III	10	Mathematics III and Electronics III
Design Project III	10	Electronics II and Projects II
Digital Systems I	10	Grade 12
Digital Systems II	10	Digital Systems I
Digital Systems III	10	Digital Systems II

Electrical Engineering I	10	Grade 12
Electrical Engineering II	10	Electrical Engineering I
Electrical Engineering III	10	Electrical Engineering II
Electronic Applications III	10	Electronics III
Electronic Communication II	10	Electrical Engineering II and Electronics II
Electronics I	10	Grade 12
Electronics II	10	Electronics I
Electronics III	10	Electronics II
Industrial Experience 0	0	Grade 12
Life Skills 0	0	Grade 12
Logic Design III	10	Digital Systems II
Mathematics 0	0	Grade 12 Mathematics
Mathematics I	10	Mathematics 0
Mathematics II	10	Mathematics I
Mathematics III	10	Mathematics II
Physics 0	0	Grade 12 Physical Sciences
Projects I	10	Electronics I
Projects II	10	Projects I and Electronics II
Radio Engineering III	10	Electronic Communication II
Work-integrated Learning I	60	Successful completion of all Semester 1, Semester 2 and Semester 3 instructional offerings
Work-integrated Learning II	60	Work-integrated Learning I and successful completion of all instructional offerings

29.3 NATIONAL DIPLOMA: ENGINEERING: ELECTRICAL (ELECTRONIC LIGHT CURRENT (LC) ECP EXNDEC

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 360
MINIMUM CREDITS REQUIRED: 370
HEMIS CREDITS 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 4 years

Statement of the purpose of the qualification:

The purpose of the qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and professional recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering (Electrical Engineering);
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings:

1ST YEAR				**INSTRUCTIONAL OFFERINGS**	**SAQA CREDITS**	**HEMIS CREDITS**
SEMESTER 1		**SEMESTER 2**				
January	**July**	**January**	**July**			
ECM11BI	ECM12BI			*Communication Skills I	5	
COM11AI	COM12AI			*Computer Skills	5	
PRE1A PRE2B				English Proficiency **and** English Proficiency	0	
	PRE2B PRE1A			English Proficiency **and** English Proficiency	0	
INX01CP	INX02CP			Industrial Experience	6	
LSS01CP	LSS02CP			Life Skills	4	
WIS01CP	WIS02CP			Mathematics	10	
FIS01CP	FIS02CP			Physics	10	
PIM5011	PIM5011			Personal Information Management	0	
RSK11AB	RSK11AB			Reading Skills	0	
		EDS11BI	EDS12BI	Digital Systems I	10	
		EEN11AI	EEN12AI	*Electrical Engineering I	10	
		ELE11AI	ELE12AI	*Electronics I	10	
		WIS11AI	WIS12AI	*Mathematics I	10	
				Total:	**70**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
EDS21BI	EDS22BI			Digital Systems II	10	
EEN21AI	EEN22AI			*Electrical Engineering II	10	
ELE21AI	ELE22AI			*Electronics II	10	
WIS21AI	WIS22AI			*Mathematics II	10	
		EDS31BI	EDS32BI	Digital Systems III	10	
		EEN31AI	EEN32AI	Electrical Engineering III	10	
		EMJ21AI	EMJ22AI	Electrical Machines II	10	
		ELA31BI	ELA32BI	Electronics III	10	
		WIS31AI	WIS32AI	Mathematics III	10	
		EPR11AI	EPR12AI	Projects I	10	
				Total:	**100**	

3RD YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 5		SEMESTER 6				
January	July	January	July			
EVE31AI	EVE32AI			Electrical Distribution III	10	
EMJ31AI	EMJ32AI			Electrical Machines III	10	
ELT31AI	ELT32AI			Electronic Applications III	10	
EKM21AI	EKM22AI			Electronic Communication II	10	
EID21AI	EID22AI			Industrial Electronics II	10	
LOG31BI	LOG32BI			Logic Design III	10	
EPR21AI	EPR22AI			Projects II	10	
		ECN31BI	ECN32BI	Control Systems III	10	
		EDP31LI	EDP32LI	*Design Project III **(Light Current)**	10	
		EBE31AI	EBE32AI	Electrical Protection III	10	
		EPE31AI	EPE32AI	Power Electronics III	10	
		ERE31AI	ERE32AI	Radio Engineering III	10	
		ESO21AI	ESO22AI	Software Design II	10	
				Total:	**80**	

4TH YEAR SEMESTERS 7 & 8		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
January	July			
EEX11ZI	EEX12ZI	Work-integrated Learning I	60	
EEX21ZI	EEX22ZI	Work-integrated Learning II	60	
		Total:	**120**	

REMARKS

- All instructional offerings indicated with an asterisk (*) are compulsory.
- The minimum total credit value of all theoretical instructional offerings **must** add up to 240 SAQA credits (2 HEMIS credits).
- The total credit value for Work-integrated Learning is 120 SAQA credits.
- The National Diploma will be issued upon completion of 360 SAQA credits, which **may** include a maximum of 50 SAQA credits (0.5 HEMIS credits) from any Engineering-related learning programme. It **must**, however, include a minimum of 50 SAQA credits (0.5 HEMIS credits) of formal time at level III.
- Two intakes per year, in January and July.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Admission requirements

For candidates who matriculated in 2007 and before:

- A Grade 12 National Senior Certificate with a score of 22 to 26 on the CUT scoring scale, plus a minimum mark of 45% on standard grade in both Physical Sciences and Mathematics. A candidate must also successfully complete the selection process for admission.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2007 or before.

For candidates who matriculated in 2008 and thereafter:

- Candidates with a Grade 12 National Senior Certificate and a minimum score of 22 to 26 points on the CUT scoring scale, plus a minimum mark of 40% to 49% (level 3) in both Mathematics and Physical Sciences, may be admitted directly to the ECP. Mathematical Literacy will not be accepted in any of the Engineering disciplines.
- Candidates with a Grade 12 National Senior Certificate and a minimum score of 22 to 26 points on the CUT scoring scale, plus a minimum mark of 50% (rating 4) in both Mathematics and Physical Sciences, may also be required to undergo a selection test. Should the candidate pass the selection test, the applicant will be admitted to the mainstream programme. Mathematical Literacy will not be accepted in any of the Engineering disciplines.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2008 or thereafter.
- Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate. Candidates must also adhere to the general admission regulations for candidates who completed the N3, N4, N5 and N6 qualification at a Technical Vocational Education and Training (TVET) college.

PREREQUISITES

- A student will not be permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level.
- The student must pass all instructional offerings of the first semester of the extended curriculum in order to continue with his/her studies.

Instructional offerings	Credits	Prerequisite instructional offerings
Communication Skills I	5	Grade 12
Computer Skills I	5	Grade 12
Control Systems III	10	Mathematics III and Electronics III
Design Project III	10	Electronics II and Projects II
Digital Systems I	10	Grade 12
Digital Systems II	10	Digital Systems I
Digital Systems III	10	Digital Systems II
Electrical Engineering I	10	Grade 12
Electrical Engineering II	10	Electrical Engineering I
Electrical Engineering III	10	Electrical Engineering II
Electronic Applications III	10	Electronics III
Electronic Communication II	10	Electrical Engineering II and Electronics II
Electronics I	10	Grade 12
Electronics II	10	Electronics I
Electronics III	10	Electronics II
Industrial Experience 0	0	Grade 12
Life Skills 0	0	Grade 12
Logic Design III	0	Digital Systems II
Mathematics 0	0	Grade 12 Mathematics
Mathematics I	10	Mathematics 0
Mathematics II	10	Mathematics I
Mathematics III	10	Mathematics II
Physics 0	0	Grade 12 Physical Sciences
Projects I	10	Electronics I
Projects II	10	Projects I and Electronics II
Radio Engineering III	10	Electronic Communication II
Work-integrated Learning I	60	Successful completion of all Semester 1, Semester 2 and Semester 3 instructional offerings
Work-integrated Learning II	60	Work-integrated Learning I and successful completion of all instructional offerings

29.4 NATIONAL DIPLOMA: ENGINEERING: MECHANICAL ECP EXNDMG

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**360**
MINIMUM CREDITS REQUIRED:	**390**
HEMIS CREDITS	**3.000**
NQF LEVEL:	**6**
DURATION OF LEARNING PROGRAMME:	**4 years**

Statement of purpose of the qualification:

The purpose of the qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent Practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and professional recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering (Mechanical Engineering);
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions or judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings:

1ST YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1		SEMESTER 2				
January	July	January	July			
EMC11BI	EMC12BI			Communication Skills I	10	
RPV11AI	RPV12AI			Computer and Programming Skills I	10	
PRE1A PRE2B				English Proficiency **and** English Proficiency	0	
	PRE2B PRE1A			English Proficiency **and** English Proficiency	0	
INX01CP	INX02CP			Industrial Experience	6	
LSS01CP	LSS02CP			Life Skills	4	
WIS01CP	WIS02CP			Mathematics	10	
FIS01CP	FIS02CP			Physics	10	
PIM5011	PIM5011			Personal Information Management	0	
RSK11AB	RSK11AB			Reading Skills	0	
		WIS11AI	WIS12AI	Mathematics I	10	
		MDR11AI	MDR12AI	Mechanical Engineering Drawing I	10	
		MAN11AI	MAN12AI	Mechanical Manufacturing Engineering I	10	
		MEC11AI	MEC12AI	Mechanics I	10	
				Total:	**90**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
MEL11AI	MEL12AI			Electrotechnology I	10	
MFM21AI	MFM22AI			Fluid Mechanics II	10	
WIS21AI	WIS22AI			Mathematics II	10	
MEM21AI	MEM22AI			Mechanics of Machines II	10	
MSM21AI	MSM22AI			Strength of Materials II	10	
		MFM31BI	MFM32BI	Fluid Mechanics III	10	
		WIS31AI	WIS32AI	Mathematics III	10	
		MED21AI	MED22AI	Mechanical Engineering Design II	10	
		MEM31BI	MEM32BI	Mechanics of Machines III	10	
		MTH21AI	MTH22AI	Thermodynamics II	10	
				Total:	**100**	

3RD YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 5		SEMESTER 6				
January	July	January	July			
MEL21BI	MEL22BI			Electrotechnology II	10	
MHM31AI	MHM32AI			Hydraulic Machines III	10	
MSM31BI	MSM32BI			Strength of Materials III	10	
MTB31BI	MTB32BI			Thermodynamics III	10	
		MSK31AI	MSK32AI	Applied Strength of Materials III	10	
		MED31BI	MED32BI	Mechanical Engineering Design III	10	
		MST31AI	MST32AI	Steam Plant III	10	
		MTM31AI	MTM32AI	Theory of Machines III	10	
				Total:	**80**	

4TH YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTERS 7 & 8				
January	July			
MEX11ZI	MEX12ZI	Work-integrated Learning I	60	
MEX21ZI	MEX22ZI	Work-integrated Learning II	60	
		Total:	**120**	

REMARKS

- All instructional offerings from Semesters 1 to 8 are compulsory.
- The minimum total credit value of all theoretical instructional offerings is 240 SAQA credits (2 HEMIS credits).
- The total credit value for Work-integrated Learning is 120 SAQA credits (1 HEMIS credit).
- The National Diploma will be issued upon completion of 360 SAQA credits, which **may** include a maximum of 50 SAQA credits from any Engineering-related instructional programme. It **must**, however, include a minimum of 50 SAQA credits of formal time at level III.
- Two intakes per year, in January and July.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Students may not simultaneously enrol for subjects spanning more than two academic semesters. For example: A student may enrol for Semester 2 and Semester 3 subjects simultaneously, but may then not enrol for any Semester 1 or Semester 4 subjects.

Students may not enrol for subjects that involve timetable clashes.

Admission requirements

For candidates who matriculated in 2007 and before:

- A Grade 12 National Senior Certificate with a score of 22 to 26 on the CUT scoring scale, plus a minimum mark of 45% on standard grade in both Physical Sciences and Mathematics. A candidate must also successfully complete the selection process for admission.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2007 or before.

For candidates who matriculated in 2008 and thereafter:

- Candidates with a Grade 12 National Senior Certificate and a minimum score of 22 to 26 points on the CUT scoring scale, plus a minimum mark of 40% to 49% (level 3) in both Mathematics and Physical Sciences, may be admitted directly to the ECP. Mathematical Literacy will not be accepted in any of the Engineering disciplines.
- Candidates with a Grade 12 National Senior Certificate with a minimum score of 22 to 26 points on the CUT scoring scale, plus a minimum mark of 50% (rating 4) in both Mathematics and Physical Sciences, may also be required to undergo a selection test. Should the candidate pass the selection test, the applicant will be admitted to the mainstream programme. Mathematical Literacy will not be accepted in any of the Engineering disciplines.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2008 or thereafter.
- Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate. Candidates must also adhere to the general admission regulations for candidates who completed the N3, N4, N5 and N6 qualification at a Technical Vocational Education and Training (TVET) college.

Optional instructional offerings

All instructional offerings are compulsory.

PREREQUISITES

- A student will not be permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level.
- The student must pass all instructional offerings of the first semester of the extended curriculum in order to continue with his/her studies.

Instructional offerings	Credits	Prerequisite instructional offerings
Applied Strength of Materials III	10	Strength of Materials III
Communication Studies I	10	Grade 12
Computer and Programming Skills I	10	Grade 12
Electrotechnology I	10	Grade 12
Electrotechnology II	10	Electrotechnology I
Fluid Mechanics II	10	Mechanics I
Fluid Mechanics III	10	Fluid Mechanics II

Hydraulic Machines III	10	Fluid Mechanics III
Industrial Experience 0	6	Grade 12
Life Skills 0	4	Grade 12
Mathematics 0	10	Grade 12 Mathematics
Mathematics I	10	Mathematics 0
Mathematics II	10	Mathematics I
Mathematics III	10	Mathematics II
Mechanical Engineering Design II	10	Mechanics I
Mechanical Engineering Design III	10	Mechanical Engineering Design II
Mechanical Engineering Drawing I	10	Grade 12
Mechanical Manufacturing Engineering I	10	Grade 12
Mechanics I	10	Grade 12
Mechanics of Machines II	10	Mechanics I
Mechanics of Machines III	10	Mechanics of Machines II
Physics 0	10	Grade 12 Physical Sciences
Steam Plant III	10	Thermodynamics III
Strength of Materials II	10	Mechanics I
Strength of Materials III	10	Strength of Materials II
Theory of Machines III	10	Mechanics of Machines III
Thermodynamics II	10	Mechanics I
Thermodynamics III	10	Thermodynamics II
Work-integrated Learning I	10	Successful completion of all Semester 1 to Semester 6 instructional offerings
Work-integrated Learning II	10	Work-integrated Learning I

29.5 NATIONAL DIPLOMA: INFORMATION TECHNOLOGY ECP (SOFTWARE DEVELOPMENT) EXNDIS

(No new first-year intake for the National Diploma: Information Technology ECP (Software Development) as from 2017. This programme will be phased out.)

This learning programme will be offered in Bloemfontein and Welkom.

SAQA CREDITS: 414
MINIMUM CREDITS REQUIRED: 414
HEMIS CREDITS 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 4 years

Instructional offerings

1ST YEAR	2ND YEAR	3RD YEAR	4TH YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
~~PPC00FP~~				~~Programming Principles~~	~~15~~	
~~LSK00FP~~				~~Life Skills~~	~~15~~	
~~BSC00FP~~				~~Business Communication~~	~~15~~	
~~PRE1A~~				~~English Proficiency~~ ~~**and**~~	~~9~~	
~~PRE2B~~				~~English Proficiency~~	~~9~~	
~~PIM5011~~				~~Personal Information Management~~	~~0~~	
~~RSK11AB~~				~~Reading Skills~~	~~0~~	

1ST YEAR	2ND YEAR	3RD YEAR	4TH YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
	~~OPG10BB~~			~~Development Software I~~	~~30~~	
	~~INL10DB~~			~~Information Systems I~~	~~30~~	
	~~ITV10AB~~			~~Information Technology Skills I~~	~~30~~	
	~~ITW10AB~~			~~IT Mathematics I~~	~~30~~	
		OPG20BB		Development Software II	30	
		INL20DB		Information Systems II	30	
		TPG10AB		Technical Programming I	30	
		SPG11AB		System Software I **(Semester 1)**	15	
		SPG12AB		System Software I **(Semester 2)**	15	
			OPG30BB	Development Software III	30	
			INL30EB	Information Systems III	30	
			TPG20AB	Technical Programming II	30	
			SPG21CB	System Software II **(Semester 1) or**	15	
			GID10AB	Graphical User Interface Design I	15	
			SPG22CB	System Software II **(Semester 2) or**	15	
			GID10AB	Graphical User Interface Design I	15	
				Total:	**414**	

REMARKS

16 theoretical instructional offerings are to be taken over a period of four years.

Only one intake per year, in January.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Admission requirements

For candidates who matriculated in 2007 and before:
Students with an M-score of between 22 and 27, with a minimum mark of 60% in standard grade or 40% on higher grade in either Mathematics or Computer Studies, will be selected according to the outcome of a selection test.

For candidates who completed the National Senior Certificate (NSC) in 2008 and thereafter:
Students with an M-score of between 22 and 27 on the CUT scoring scale, with a minimum mark of 60% in Mathematical Literacy or 40% in either Mathematics or Information Technology, will be selected according to the outcome of a selection test.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

Admission to this learning programme is subject to selection.

PREREQUISITES

The student may only enrol for the second-, third- or fourth-year level of an instructional offering if he/she has passed the first-, second- or third-year level respectively.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Instructional offerings	**Credits**	**Prerequisite instructional offerings**
Programming Principles	15	Grade 12
Life Skills	15	Grade 12
Business Communication	15	Grade 12
English Proficiency	9	Grade 12
Development Software I	30	Programming Principles
Information Systems I	30	Grade 12
Information Technology Skills I	30	Grade 12
IT Mathematics I	30	Grade 12
Development Software II	30	Development Software I
Information Systems II	30	Development Software I and Information Systems I
Technical Programming I	30	Development Software I
System Software I (Semester 1)	15	Information Systems I
System Software I (Semester 2)	15	System Software I (Semester 1)
Development Software III	30	Development Software II
Information Systems III	30	Information Systems II
Technical Programming II	30	Technical Programming I
System Software II (Semester 1)	15	System Software I (Semester 2)
System Software II (Semester 2)	15	System Software II (Semester 1)
Graphical User Interface Design I	30	Development Software I

29.6 NATIONAL DIPLOMA: INFORMATION TECHNOLOGY ECP (WEB AND APPLICATION DEVELOPMENT) EXNDIT

(No new first-year intake for the National Diploma: Information Technology ECP (Web and Application Development) as from 2017. This programme will be phased out.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 414
MINIMUM CREDITS REQUIRED: 414
HEMIS CREDITS 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 4 years

Instructional offerings

1ST YEAR	2ND YEAR	3RD YEAR	4TH YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
~~PPC00FP~~				~~Programming Principles~~	~~15~~	
~~LSK00FP~~				~~Life Skills~~	~~15~~	
~~BSC00FP~~				~~Business Communication~~	~~15~~	
~~PRE1A~~ ~~PRE2B~~ ~~PIM5011~~				~~English Proficiency~~ **~~and~~** ~~English Proficiency~~ ~~Personal Information Management~~	~~9~~ ~~9~~ ~~0~~	
~~RSK11AB~~				~~Reading Skills~~	~~0~~	
	~~OPG10BB~~			~~Development Software I~~	~~30~~	
	~~INL10DB~~			~~Information Systems I~~	~~30~~	
	~~ITV10AB~~			~~Information Technology Skills I~~	~~30~~	
	~~ITW10AB~~			~~IT Mathematics I~~	~~30~~	
		INP20AB		Internet Programming II	30	
		INL20DB		Information Systems II	30	
		SPG11AB		System Software I **(Semester 1)**	15	
		SPG12AB		System Software I **(Semester 2)**	15	
		WEB20AB		Web Management II	30	
			INP30AB	Internet Programming III	30	
			INL30EB	Information Systems III	30	
			GID10AB	Graphical User Interface Design I	30	
			WEB30AB	Web Management III	30	
				Total:	**414**	

REMARKS

16 theoretical instructional offerings are to be taken over a period of four years.

Only one intake per year, in January.

After successful completion of this qualification, the National Diploma will be conferred during an official graduation ceremony of CUT.

Admission requirements

For candidates who matriculated in 2007 and before:
Students with an M-score of between 22 and 27, with a minimum mark of 60% in standard grade or 40% on higher grade in either Mathematics or Computer Studies, will be selected according to the outcome of a selection test.

For candidates who completed the NSC in 2008 and thereafter:
Students with an M-score of between 22 and 27 on the CUT scoring scale, with a minimum mark of 60% in Mathematical Literacy, or 40% in either Mathematics or Information Technology, will be selected according to the outcome of a selection test.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

Admission to this learning programme is subject to selection.

PREREQUISITES

The student may only enrol for the second-, third- or fourth-year level of an instructional offering if he/she has passed the first-, second- or third-year level respectively.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Instructional offerings	**Credits**	**Prerequisite instructional offerings**
Programming Principles	30	Grade 12
Life Skills	30	Grade 12
Business Communication	30	Grade 12
English Proficiency	9	Grade 12
Development Software I	30	Programming Principles
Information Systems I	30	Grade 12
Information Technology Skills I	30	Grade 12
IT Mathematics I	30	Grade 12
Internet Programming II	30	Development Software I
Information Systems II	30	Development Software I and Information Systems I
Web Management I	30	Development Software I
System Software I (Semester 1)	15	Information Systems I
System Software I (Semester 2)	15	System Software I (Semester 1)
Information Systems III	30	Information Systems II
Internet Programming III	30	Internet Programming II
Web Management III	30	Web Management II
Graphical User Interface Design I	30	Development Software I

30. DIPLOMAS

30.1 DIPLOMA IN COMPUTER NETWORKING DP_CMN

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 381
MINIMUM CREDITS REQUIRED: 381
HEMIS CREDITS 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 3 years

Instructional offerings

1ST YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
LCS5011	LCS5012	Academic Literacy and Communication Studies	12	
ITE115C	ITE125C	Information Technology Essentials IA & IB	30	
ITM115C	ITM125C	Information Technology Mathematics IA & IB	30	
PIM5011		Personal Information Management	0	
PSA115C		Problem-solving and Algorithms	15	
RSK11AB		Reading Skills	0	
SPG115C		System Software IA	15	
	SPG125C	System Software IB	15	
SSD115C	SSD125C	System Software Development I	30	
		Total:	**141**	

2ND YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
CMN216C		Communication Networks II A	15	
DBS216C		Databases II	15	
SSD216C	SSD226C	System Software Development II	30	
SPG216C		System Software IIA	30	
	CMN226C	Communication Networks IIB	15	
	SPG226C	System Software IIB	15	
	SSE226C	System Software Engineering II	15	
		Total:	**120**	

3RD YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
CNR316C		Communication Networks Routing III	15	
CNS316C		Communication Networks Switching III	15	
SSD316C		System Software Development III	15	
SSE316C		System Software Engineering III	15	
	CMN327W	Work-integrated Learning in Computer Networking	60	
		Total:	**120**	

REMARKS

25 theoretical instructional offerings are to be taken over a period of three years.

The Diploma will be issued upon completion of 375 SAQA credits.

Only one intake per year, in January.

After successful completion of this qualification, the Diploma will be conferred during an official graduation ceremony of CUT.

Admission requirements

Admission to this learning programme is subject to selection.

For candidates who matriculated in 2007 and before:
A Grade 12 National Senior Certificate (NSC) with a score of 27 on the CUT scoring scale, plus a minimum mark of 60% on standard grade or 40% on higher grade in Mathematics or Computer Science. A candidate must also successfully complete the selection process for admission.

For candidates who completed the NSC in 2008 and thereafter:
A National Senior Certificate with a score of 27 on the CUT scoring scale, plus a minimum pass mark of 40% (rating 3) in Mathematics or Computer Science, or 60% (rating 5) in Mathematical Literacy.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

Refer to the heading "General" under point 12 of this chapter.

Instructional offerings	**Credits**	**Prerequisite instructional offerings**
Academic Literacy and Personal Competencies	06	Grade 12
Information Technology Mathematics IA	12	Grade 12
Information Technology Essentials IA	15	Grade 12
System Software IA	15	Grade 12
Problem-solving and Algorithms	15	Grade 12
System Software Development IA	15	Grade 12
System Software IB	15	System Software IA
Information Technology Mathematics IB	12	Information Technology Mathematics IA
Information Technology Essentials IB	15	Information Technology Essentials IA
System Software Development IB	15	System Software Development IA
Communication Networks IIA	15	System Software IB
Databases II	15	System Software Development IB
System Software Development IIB	15	System Software Development IA
System Software IIA	15	System Software IB

Communication Networks IIB	15	Communication Networks IIA
System Software Development IIB	15	System Software Development IIA
System Software Engineering II	15	Databases II
System Software IIB	15	System Software IIA
Communication Networks Switching III	15	System Software IIB
Communication Networks Routing III	15	System Software IIB
System Software Engineering III	15	System Software Engineering II
System Software Development III	15	System Software Development IIB
Work-integrated Learning in Computer Networking	60	System Software IIB and Communication Networks IIB

30.2 DIPLOMA IN ENGINEERING TECHNOLOGY IN CIVIL ENGINEERING DP_CVL

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**280**
MINIMUM CREDITS REQUIRED:	**280**
HEMIS CREDITS	**2.000**
NQF LEVEL:	**6**
DURATION OF LEARNING PROGRAMME:	**2 years**

Statement of the purpose of the qualification:

The purpose of this qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and professional recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;

- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

1ST YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1		SEMESTER 2				
January	July	January	July			
LCS5011	LCS5012			Academic Literacy and Communication Studies	14	
BDL11A	BDL11B			Basic Digital Literacy	14	
CCM11A	CCM11B			Construction Materials	14	
CEM11A	CEM11B			Engineering Mechanics	14	
MAT11A	MAT11B			Mathematics I	14	
		CMT12B	CMT12A	Construction Methods	14	
		CDE12B	CDR12A	Drawing I	14	
		CSM12B	CSM12A	Soil Mechanics	14	
		MAT12B	MAT12A	Mathematics II	14	
		CTS12B	CTS12A	Theory of Structures	14	
				Total:	**140**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
CDR21A	CDR21B			Drawings II	14	
CDS21A	CDS21B			Design of Structures I	14	
CHY21A	CHYS1B			Hydrology	14	
CSU21A	CSU21B			Surveying I	14	
CTE21A	CTE21B			Transportation Engineering I	14	
		CDS22B	CDS22A	Design of Structures II	14	
		CPM22B	CPM22A	Engineering Project Management	14	
		CHD22B	CHD22A	Hydraulics	14	
		CSU22B	CSU22A	Surveying II	14	
		CTE22B	CTE22A	Transportation Engineering II	14	
				Total:	**140**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Academic Literacy and Communication Studies	14	Grade 12
Construction Materials	14	Grade 12
Construction Methods	14	Grade 12
Design of Structures I	14	Theory of Structures
Design of Structures II	14	Theory of Structures
Digital Literacy	14	Grade 12
Drawing I	17	Grade 12
Drawing II	14	Drawing I
Engineering Mechanics	14	Grade 12
Engineering Project Management	14	Grade 12
Hydraulics	14	Mathematics I, Engineering Mechanics, and Drawing I
Hydrology	14	Mathematics II
Mathematics I	14	Grade 12
Mathematics II	14	Mathematics I
Soil Mechanics	14	Grade 12
Surveying I	14	Mathematics I
Surveying II	14	Surveying I
Theory of Structures	14	Engineering Mechanics I
Transportation Engineering I	14	Theory of Structures
Transportation Engineering II	14	Design of Structures I

REMARKS

All instructional offerings shown are compulsory.
The total credit value of all instructional offerings **must** add up to 280.

Two intakes per year, in January and July. The first year intake for this programme is the first semester of 2018.

After successful completion of this qualification, the Diploma in Engineering Technology will be awarded during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Admission requirements:

For candidates who matriculated in 2007 and before:
A National Senior Certificate (NSC) with a score of 27 and higher on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in both Physical Sciences and Mathematics.

For candidates who completed the NSC in 2008 and thereafter:
A National Senior Certificate with a score of 27 and higher on the CUT scoring scale, plus a minimum pass mark of 50% (rating 4) in both Mathematics and Physical Sciences. Mathematical Literacy will **not** be accepted.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

- The student is not permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level (see prerequisites).

30.3 DIPLOMA IN ENGINEERING TECHNOLOGY IN ELECTRICAL ENGINEERING DP_ELE

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 280
MINIMUM CREDITS REQUIRED: 280
HEMIS CREDITS 2.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 2 years

Instructional offerings

1ST YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1		SEMESTER 2				
January	July	January	July			
ALP115C	ALP125C			Academic Literacy and Personal Competencies	14	
BDL11A	BDL11B			Basic Digital Literacy	14	
EEN115A	EEN115B			Electrical Engineering I	14	
ELE115A	ELE115B			Electronic Fundamentals I	14	
MAT115A	MAT115B			Mathematics	14	
		EDS125B	EDS125A	Digital Systems II	14	
		EEN125B	EEN125A	Electrical Engineering II	14	
		ELA125B	ELA125A	Electronic Applications II	14	
		EPG125B	EPG125A	Programming I	14	
		MAT126B	MAT126A	Mathematics II	14	
				Total:	**140**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
EDS216A	EDS216B			Digital Systems III	14	
ELA216A	ELA216B			Electronic Applications III	14	
ELM216A	ELM216B			Electrical Machines II	14	
ENW216A	ENW216B			Network Systems II	14	
MAT216A	MAT216B			Mathematics III	14	
		ECM226B	ECM226A	Electronic Communication III	14	
		ECS226B	ECS226A	Control Systems III	14	
		EDP226B	EDP226A	Design Project III	14	
		EID226B	EID226A	Industrial Electronics III	14	
		ENS226B	ENS226A	Energy Systems III	14	
				Total:	**140**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Control Systems III	14	Mathematics III and Digital Systems II
Design Project III	14	Electronic Application III and Digital Systems III & Electrical Machines II and Network Systems II
Digital Literacy I	14	Grade 12
Digital Systems II	14	Digital Literacy and Electronic Fundamentals I
Digital Systems III	14	Digital Systems II
Electronic Application II	14	Electronic Fundamentals I and Digital Literacy I
Electronic Application III	14	Electronic Application II
Electronic Communication III	14	Electronic Application III
Electronic Fundamentals I	14	Grade 12
Electrical Engineering I	14	Grade 12
Electrical Engineering II	14	Electrical Engineering I and Digital Literacy I
Electrical Machines II	14	Electrical Engineering II
Energy Systems III	14	Electrical Engineering II
Industrial Electronics III	14	Electronic Application III and Electrical Machines II
Mathematics I	14	Grade 12
Mathematics II	14	Mathematics I
Mathematics III	14	Mathematics II
Network Systems II	14	Programming I
Programming I	14	Digital Literacy I

REMARKS

The total SAQA credit value of all instructional offerings **must** add up to 280.
The Diploma will be issued upon completion of 280 SAQA credits.
At least 70 SAQA credits must be earned in the second-year level instructional offerings.
No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies, Digital Literacy I, Personal Information Management, and Reading Skills.

Two intakes per year, in January and July. After successful completion of this qualification, the Diploma will be awarded during an official graduation ceremony of CUT.

Students may not simultaneously enrol for subjects spanning more than two academic semesters. For example: A student may enrol for Semester 2 and Semester 3 subjects simultaneously, but may then not enrol for any Semester 1 and Semester 4 subjects.

Students may not enrol for subjects that involve timetable clashes.

Admission requirements

For candidates who matriculated in 2007 and before:
A National Senior Certificate (NSC) with a score of 27 or higher on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in English, Physical Sciences and Mathematics.

For candidates who completed the NSC in 2008 and thereafter:
A National Senior Certificate with a score of 27 or higher on the CUT scoring scale, plus a minimum pass mark of 50% (rating 4) in Mathematics, Physical Sciences and English. Mathematical Literacy will **not** be accepted.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

The student is not permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level.

30.4 DIPLOMA IN ENGINEERING TECHNOLOGY IN MECHANICAL ENGINEERING DP_MEC

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**280**
MINIMUM CREDITS REQUIRED:	**280**
HEMIS CREDITS	**2.000**
NQF LEVEL:	**6**
DURATION OF LEARNING PROGRAMME:	**2 years**

Statement of purpose of the qualification:

The purpose of the qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent Practising Engineering Technician. It is intended to subsequently empower the Candidate Engineering Technician to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and professional recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving well-defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering (Mechanical Engineering);
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions or judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technician (at national diploma level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

1ST YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1		SEMESTER 2				
January	July	January	July			
LCS5011	LCS5012			Academic Literacy and Communication studies	14	
BDL11A	BDL11B			Digital Literacy I	14	
MMN11A	MMN11B			Manufacturing I	14	
MAT11a	MAT11B			Mathematics I	14	
MMC11A	MMC11B			Mechanics I	14	
PIM5011	PIM5012			Personal Information Management	0	
RSK11AB	RSK11AB			Reading Skills	0	
		EEN12B	EEN12A	Electrical Engineering	14	
		MMT12B	MMT12A	Materials I	14	
		MAT12B	MAT12A	Mathematics II	14	
		MDR12B	MDR12A	Mechanical Drawing I	14	
		MMM12B	MMM12A	Mechanics of Machines I	14	
				Total:	**140**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
MFM21A	MFF21B			Fluid Mechanics I	14	
MAT12A	MAT12B			Mathematics III	14	
MED21A	MED21B			Mechanical Engineering Design I	14	
MSM21A	MSM21B			Strength of Materials I	14	
MTH21A	MTH21B			Thermodynamics I	14	
		MFM22B	MFM22A	Fluid Mechanics II	14	
		MED22B	MED22A	Mechanical Engineering Design II	14	
		MMM22B	MMM22A	Mechanics of Machines II	14	
		MSM22B	MSM22A	Strength of Materials II	14	
		MTH22B	MTH22A	Thermodynamics II	14	
				Total:	**140**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Academic Literacy and Communication Studies	14	Grade 12
Digital Literacy I	14	Grade 12
Electrical Engineering I	14	Grade 12
Fluid Mechanics I	14	Mechanics I
Fluid Mechanics II	14	Fluid Mechanics I
Manufacturing I	14	Grade 12
Materials I	14	Grade 12

Mathematics I	14	Grade 12
Mathematics II	14	Mathematics I
Mathematics III	14	Mathematics II
Mechanical Drawing I	14	Grade 12
Mechanical Engineering Design I	14	Mechanical Drawing I
Mechanical Engineering Design II	14	Mechanical Engineering Design I
Mechanics I	14	Grade 12
Mechanics of Machines I	14	Mechanics I
Mechanics of Machines II	14	Mechanics of Machines I
Strength of Materials I	14	Mechanics I
Strength of Materials II	14	Strength of Materials I
Thermodynamics I	14	Mechanics I
Thermodynamics II	14	Thermodynamics I

REMARKS

The total SAQA credit value of all instructional offerings **must** add up to 280.
The Diploma will be issued upon completion of 280 SAQA credits.
At least 70 SAQA credits must be earned in the second-year level instructional offerings.
No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies, Digital Literacy I, Personal Information Management, and Reading Skills.

Two intakes per year, in January and July. After successful completion of this qualification, the Diploma will be awarded during an official graduation ceremony of CUT.

Students may not simultaneously enrol for subjects spanning more than two academic semesters. For example: A student may enrol for Semester 2 and Semester 3 subjects simultaneously, but may then not enrol for any Semester 1 and Semester 4 subjects.

Students may not enrol for subjects that involve timetable clashes.

Admission requirements

For candidates who matriculated in 2007 and before:
A National Senior Certificate (NSC) with a score of 27 or higher on the CUT scoring scale, plus a minimum mark of 50% on standard grade or 40% on higher grade in English, Physical Sciences and Mathematics.
For candidates who completed the NSC in 2008 and thereafter:
A National Senior Certificate with a score of 27 or higher on the CUT scoring scale, plus a minimum pass mark of 50% (rating 4) in Mathematics, Physical Sciences and English. Mathematical Literacy will **not** be accepted.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

- The student is not permitted to continue with an instructional offering on the subsequent level before successfully completing the preceding level.

30.5 DIPLOMA IN INFORMATION TECHNOLOGY DP_ITC

This learning programme will be offered in Bloemfontein and Welkom.

SAQA CREDITS: 396
MINIMUM CREDITS REQUIRED: 396
HEMIS CREDITS 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 3 years

Instructional offerings

1ST YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
LCS5011	LCS5012	Academic Literacy and Communication Studies	12	
ITE115C	ITE125C	Information Technology Essentials IA & IB	30	
ITM115C	ITM125C	Information Technology Mathematics IA & IB	30	
PIM5011		Personal Information Management	0	
PSA115C		Problem-solving and Algorithms	15	
RSK11AB		Reading Skills	0	
SOD115C	SOD125C	Software Development IA & IB	30	
	INP125C	Internet Programming I	15	
		Total:	**126**	

2ND YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
DBS216C		Databases II	15	
GID216C		Graphic Design II	15	
SOD216C		Software Development IIA	15	
TPG216C		Technical Programming IIA	15	
WEB215C		Web Content Management II	15	
	GUD226C	Graphical User Interface Design II	15	
	INT226C	Internet Technologies II	15	
	SOD226C	Software Development IIB	15	
	SOE226C	Software Engineering II	15	
	TPG226C	Technical Programming IIB	15	
		Total:	**150**	

3RD YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
CMN316C		Communication Networks II	15	
ITS316C		Information Technology and Society I	10	
SOD316C		Software Development III	15	
SOE316C		Software Engineering III	15	
TPG316C		Technical Programming III	15	
	ITC327W	Work-integrated Learning in Information Technology	50	
		Total:	**120**	

REMARKS

27 theoretical instructional offerings are to be taken over a period of three years.

The Diploma will be issued upon completion of 390 SAQA credits.

Only one intake per year, in January.

After successful completion of this qualification, the Diploma will be conferred during an official graduation ceremony of CUT.

Admission requirements

Admission to this learning programme is subject to selection.

For candidates who matriculated in 2007 and before:
A Grade 12 National Senior Certificate (NSC) with a score of 27 on the CUT scoring scale, plus a minimum mark of 60% on standard grade or 40% on higher grade in Mathematics or Computer Science. A candidate must also successfully complete the selection process for admission.

For candidates who completed the NSC in 2008 and thereafter:
A National Senior Certificate with a score of 27 on the CUT scoring scale, plus a minimum pass mark of 40% (rating 3) in Mathematics or Computer Science, or 60% (rating 5) in Mathematical Literacy.
Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

Refer to the heading "General" under point 12 of this chapter.

Instructional offerings	Credits	Prerequisite instructional offerings
Academic Literacy and Personal Competencies	06	Grade 12
Information Technology Mathematics IA	12	Grade 12
Information Technology Essentials IA	15	Grade 12
Internet Programming I	15	Grade 12
Problem-solving and Algorithms	15	Grade 12
Software Development IA	15	Grade 12
Information Technology Mathematics IB	12	Information Technology Mathematics IA
Information Technology Essentials IB	15	Information Technology Essentials IA
Software Development IB	15	Software Development IA
Databases II	15	Software Development IB
Graphic Design II	15	Software Development IB
Software Development IIA	15	Software Development IB
Technical Programming IIA	15	Software Development IB
Web Content Management II	15	Internet Programming I
Graphical User Interface Design II	15	Graphic Design II
Software Development IIB	15	Software Development IIA
Internet Technologies II	15	Web Content Management II
Software Engineering II	15	Databases II
Technical Programming IIB	15	Technical Programming IIA
Information Technology and Society I	10	Software Engineering II
Communication Networks II	15	Internet Technologies II
Software Engineering III	15	Software Engineering II
Software Development III	15	Software Development IIB
Technical Programming III	15	Technical Programming IIB
Work-integrated Learning in Information Technology	50	Software Engineering III and Software Development III

31. DIPLOMAS: EXTENDED CURRICULUM PROGRAMMES (ECPs)

31.1 DIPLOMA IN COMPUTER NETWORKING ECP EX_CMN

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 517
MINIMUM CREDITS REQUIRED: 517
HEMIS CREDITS 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 4 years

Instructional offerings

1ST YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
FIT115C		Foundation of IT Essentials IA	25	
LSK115E		Life Skills IA	10	
PPC115C		Programming Principles IA	25	
RSK11AB		Reading Skills	0	
LCS5011	LCS5012	Academic Literacy and Communication Studies	12	
	FIT125C	Foundation of IT Essentials IB	22	
	LSK125E	Life Skills IB	10	
	PPC125C	Programming Principles IB	25	
		Total:	**132**	

2ND YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
ITM115C	ITM125C	Information Technology Mathematics IA & IB	30	
PIM5011		Personal Information Management	0	
SPG115C		System Software IA	15	
SSD115C	SSD125C	System Software Development IA & IB	30	
	ITE125C	Information Technology Essentials IB	15	
	SPG125C	System Software IB	15	
		Total:	**105**	

3RD YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
CMN216C		Communication Networks IIA	15	
DBS216C		Databases II	15	
SSD216C	SSD226C	System Software Development IIA & IIB	30	
SPG216C		System Software IIA	15	
	CMN226C	Communication Networks IIB	15	
	SPG226C	System Software IIB	15	
	SSE226C	System Software Engineering II	15	
		Total:	**120**	

4TH YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
CNR316C		Communication Networks Routing III	15	
CNS316C		Communication Networks Switching III	15	
SSD316C		System Software Development III	15	
SSE316C		System Software Engineering III	15	
	CMN327W	Work-integrated Learning in Computer Networking	60	
		Total:	**120**	

REMARKS

29 theoretical instructional offerings are to be taken over a period of four years.

The Diploma will be issued upon completion of 390 SAQA credits.

In the ECP programme, the following subjects have the same content as the normal programme:

ECP subject		Diploma subject	
PPC115C	Programming Principles IA	PSA115C	Problem-solving and Algorithms
PPC125C	Programming Principles IB		
FIT115C	Foundation of IT Essentials IA	ITE125C	Information Technology Essentials IA
FIT125C	Foundation of IT Essentials IB		

Only one intake per year, in January.

After successful completion of this qualification, the Diploma will be conferred during an official graduation ceremony of CUT.

Admission requirements

Admission to this learning programme is subject to selection.

For candidates who matriculated in 2007 and before:
Students with an M-score of between 22 and 27, and a minimum mark of 60% on standard grade or 40% on higher grade in Mathematics or Computer Studies, will be selected according to the outcome of a selection test.

For candidates who completed the National Senior Certificate (NSC) in 2008 and thereafter:
Students with an M-score of between 22 and 27 on the CUT scoring scale, with a minimum pass mark of 60% in Mathematical Literacy or 40% in either Mathematics or Information Technology, will be selected according to the outcome of a selection test.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

Refer to the heading "General" under point 12 of this chapter.

Instructional offerings	Credits	Prerequisite instructional offerings
Programming Principles IA	25	Grade 12
Life Skills IA	10	Grade 12
Foundation of IT Essentials IA	25	Grade 12
Reading Skills	00	Grade 12
Programming Principles IB	25	Programming Principles IA
Life Skills IB	10	Life Skills IA
Foundation of IT Essentials IB	25	Foundation of IT Essentials IA
Academic Literacy and Personal Competencies	06	Grade 12
Personal Information Management	00	Grade 12
Information Technology Mathematics IA	15	Grade 12
System Software IA	15	Programming Principles IB
System Software Development IA	15	Programming Principles IB
System Software IB	15	System Software IA
Information Technology Mathematics IB	15	Information Technology Mathematics IA
Information Technology Essentials IB	15	Foundation of IT Essentials IB
System Software Development IB	15	System Software Development IA
Communication Networks IIA	15	System Software IB
Databases II	15	System Software Development IB
System Software Development IIA	15	System Software Development IB
System Software IIA	15	System Software IB
Communication Networks IIB	15	Communication Networks IIA
System Software Development IIB	15	System Software Development IIA
System Software Engineering II	15	Databases II
System Software IIB	15	System Software IIA
Communication Networks Switching III	15	System Software IIB
Communication Networks Routing III	15	System Software IIB
System Software Engineering III	15	System Software Engineering II
System Software Development III	15	System Software Development II
Work-integrated Learning in Computer Networking	60	System Software IIB & Communication Networks IIB

31.2 DIPLOMA IN INFORMATION TECHNOLOGY ECP EX_ITC

This learning programme will be offered in Bloemfontein and Welkom.

SAQA CREDITS: 492
MINIMUM CREDITS REQUIRED: 492
HEMIS CREDITS 3.000
NQF LEVEL: 6
DURATION OF LEARNING PROGRAMME: 4 years

Instructional offerings

1ST YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
FIT115C		Foundation of IT Essentials IA	25	
LSK115E		Life Skills IA	10	
PPC115C		Programming Principles IA	25	
RSK11AB		Reading Skills	0	
LCS5011	LCS5012	Academic Literacy and Communication Studies	12	
	FIT125C	Foundation of IT Essentials IB	25	
	LSK125E	Life Skills IB	10	
	PPC125C	Programming Principles IB	25	
		Total:	**132**	

2ND YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
ITM115C	ITM125C	Information Technology Mathematics I	30	
PIM5011		Personal Information Management	0	
SOD115C	SOD125C	Software Development I	30	
	ITE125C	Information Technology Essentials I	15	
	INP125C	Internet Programming I	15	
		Total:	**90**	

3RD YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
DBS216C		Databases II	15	
GID216C		Graphic Design II	15	
SOD216C		Software Development IIA	15	
TPG216C		Technical Programming IIA	15	
WEB215C		Web Content Management II	15	
	GUD226C	Graphical User Interface Design II	15	
	INT226C	Internet Technologies II	15	
	SOD226C	Software Development IIB	15	
	SOE226C	Software Engineering II	15	
	TPG226C	Technical Programming IIB	15	
		Total:	**150**	

4TH YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
CMN316C		Communication Networks II	15	
ITS316C		Information Technology and Society I	10	
SOD316C		Software Development III	15	
SOE316C		Software Engineering III	15	
TPG316C		Technical Programming III	15	
	ITC327W	Work-integrated Learning in Information Technology	50	
		Total:	**120**	

REMARKS

31 theoretical instructional offerings are to be taken over a period of four years.

The Diploma will be issued upon completion of 405 SAQA credits.

In the ECP programme, the following subjects have the same content as the normal programme:

ECP subject		Diploma subject	
PPC115C	Programming Principles IA	PSA115C	Problem-solving and Algorithms
PPC125C	Programming Principles IB		
FIT115C	Foundation of IT Essentials IA	ITE125C	Information Technology Essentials IA
FIT125C	Foundation of IT Essentials IB		

Only one intake per year, in January.

After successful completion of this qualification, the Diploma will be conferred during an official graduation ceremony of CUT.

Admission requirements

Admission to this learning programme is subject to selection.

For candidates who matriculated in 2007 and before:
Students with an M-score of between 22 and 27, and a minimum mark of 60% on standard grade or 40% on higher grade in either Mathematics or Computer Studies, will be selected according to the outcome of a selection test.

For candidates who completed the National Senior Certificate (NSC) in 2008 and thereafter:
Students with an M-score of between 22 and 27 on the CUT scoring scale, with a minimum pass mark of 60% in Mathematical Literacy or 40% in either Mathematics or Information Technology, will be selected according to the outcome of a selection test.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

Refer to the heading "General" under point 12 of this chapter.

Instructional offerings	Credits	Prerequisite instructional offerings
Programming Principles IA	25	Grade 12
Life Skills IA	10	Grade 12
Foundation of IT Essentials IA	25	Grade 12
Reading Skills	00	Grade 12
Programming Principles IB	25	Programming Principles IA
Life Skills IB	10	Life Skills IA
Foundation of IT Essentials IB	25	Foundation of IT Essentials IA
Academic Literacy and Personal Competencies	06	Grade 12
Personal Information Management	00	Grade 12
Information Technology Mathematics IA	12	Grade 12
Internet Programming I	15	Programming Principles IB
Software Development IA	15	Programming Principles IB
Information Technology Mathematics IB	12	Information Technology Mathematics IA
Information Technology Essentials IB	15	Foundation of IT Essentials IB
Software Development IB	15	Software Development IA
Databases II	15	Software Development IB
Graphic Design II	15	Software Development IB
Software Development IIA	15	Software Development IB
Technical Programming IIA	15	Software Development IB
Web Content Management II	15	Internet Programming I
Graphical User Interface Design II	15	Graphic Design II
Internet Technologies II	15	Web Content Management II
Software Development IIB	15	Software Development II A
Software Engineering II	15	Databases II
Technical Programming IIB	15	Technical Programming II A
Information Technology and Society I	10	Software Engineering II
Communication Networks II	15	Internet Technologies II
Software Engineering III	15	Software Engineering II
Software Development III	15	Software Development IIB
Technical Programming III	15	Technical Programming IIB
Work-integrated Learning in Information Technology	50	Software Engineering III and Software Development III

32. ADVANCED DIPLOMA

32.1 ADVANCED DIPLOMA IN LOGISTICS AND TRANSPORTATION MANAGEMENT ADLTME

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 132
MINIMUM CREDITS REQUIRED: 160
HEMIS CREDITS 1.000
NQF LEVEL: 7
DURATION OF LEARNING PROGRAMME: 1 year

Instructional offerings

1ST YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
BLM0011		Business Logistics and Management I	14	
IRP0011		Introduction to Research & Research Project	12	
PJM0011		Project Management	12	
TPP0011		Transportation Planning	18	
TFM0011		Traffic Planning and Management#	12	
QTO0011		Quantitative Techniques and Optimisation#	12	
	BLM0022	Business Logistics and Management II	14	
	TSE0022	Transportation Economics	12	
	IVM0022	Inventory Management	12	
	FRM0022	Freight Planning and Management	18	
	THE0022	Transportation and Highway Engineering#	12	
	URP0022	Urban and Regional Planning#	12	
		Total:	**160**	

***Year subject.**
#Elective subjects: Students are required to choose at least one elective per semester.

REMARKS

- Only one intake per year, in January.
- A minimum of 132 SAQA credits is required to obtain a qualification.

Admission requirements

For candidates who matriculated in 2007 and before:

- A National Diploma in either Civil Engineering (or Engineering Technology in Civil) or Management (both at NQF level 6); **OR**
- a Diploma in either Civil Engineering (or Engineering Technology in Civil) or Management (both at NQF level 6); **OR**
- relevant, sufficient experience in the logistics and transportation sector PLUS any qualification at NQF level 6. These applications for admission will be considered individually by a CUT panel.

For candidates who completed the National Senior Certificate (NSC) in 2008 and thereafter:

- A National Diploma in either Civil Engineering (or Engineering Technology in Civil) or Management (both at NQF level 6); **OR**
- a National Diploma in either Civil Engineering (or Engineering Technology in Civil) or Management (both at NQF level 6); **OR**
- relevant, sufficient experience in the logistics and transportation sector PLUS any qualification at NQF level 6. These applications for admission will be considered individually by a CUT panel.

PREREQUISITES

- An NQF-level 6 qualification, as indicated under "admission requirements".

33. BACCALAUREUS TECHNOLOGIAE DEGREES

33.1 BACCALAUREUS TECHNOLOGIAE: CONSTRUCTION MANAGEMENT ISBTRR

(This programme will be phased out. The planned last year of intake is 2018. The planned final teach-out date is 2020. The phase-out dates are subject to change.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**120**
MINIMUM CREDITS REQUIRED:	**120**
HEMIS CREDITS	**1.000**
NQF LEVEL:	**7**
DURATION OF LEARNING PROGRAMME:	**1 year full-time or 2 years' part-time block release**

Instructional offerings

4TH YEAR	**INSTRUCTIONAL OFFERINGS**	**SAQA CREDITS**	**HEMIS CREDITS**
APC40AI	Appropriate Construction IV	20	
PRO40AI	Real Estate Management IV	20	
BEP40AI	*Building Entrepreneurship IV	20	
COE40AI	*Construction Economics IV	20	
CLP40AI	*Construction Law and Procedure IV	20	
KON40AI	*Construction Management IV	20	
DEM40AI	Development Management IV	20	
NMD10AI	*Research Methodology I	20	
	Total:	**120**	

REMARKS

*Compulsory instructional offerings.

The total credit value of fourth-level instructional offerings is 120 SAQA credits (1 HEMIS credit).

Six theoretical instructional offerings must be taken at level IV, one of which must be an instructional offering selected from the list above.
**The student must already be in possession of the National Diploma: Building, with the specific prescribed instructional offerings as stipulated in the CUT Calendar. Enquiries may be directed to the Head of Department: Built Environment. A 60% average for the National Diploma and a 60% average for Construction Management III are required.

After successful completion of this qualification, a Baccalaureus Technologiae Degree will be conferred during an official graduation ceremony of CUT.

Students following the part-time programme may not be enrolled for more than three subjects in any year of study.

33.2 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL ISBTCJ

(This programme will be phased out. The planned last year of intake is 2019. The planned final teach-out date is 2020. The phase-out dates are subject to change.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**120**
MINIMUM CREDITS REQUIRED:	**120**
HEMIS CREDITS	**1.000**
NQF LEVEL:	**7**
DURATION OF LEARNING PROGRAMME:	**1 year**

Statement of the purpose of the qualification:

The purpose of the qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent practising Engineering Technologist. It is intended to subsequently empower the Candidate Engineering Technologist to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving broadly defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;

- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technologist (at BTech level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

4TH YEAR URBAN		**INSTRUCTIONAL OFFERINGS**	**SAQA CREDITS**	**HEMIS CREDITS**
SEMESTER 1 January	**SEMESTER 2 July**			
	KMA42AI	Construction Materials Technology IV	15	
	GEO42AI	Geometric Design IV	15	
PLA41AI		Pavement Technology IV	15	
	NWK42AI	Reticulation Design and Management IV	15	
STE41AI		Urban Planning and Design IV	15	
PJK41AI	PJK42AI	Project Management: Civil IV	15	
		Total credits for specialist field:	**90**	
		Total credits for other field:	**30**	
		Grand total:	**120**	

4TH YEAR TRANSPORTATION		**INSTRUCTIONAL OFFERINGS**	**SAQA CREDITS**	**HEMIS CREDITS**
SEMESTER 1 January	**SEMESTER 2 July**			
ASF41AI		Asphalt Technology IV	15	
	BET42AI	Concrete Technology IV	15	
	GEO42AI	Geometrical Design IV	15	
PLA41AI		Pavement Technology IV	15	
	VKR42AI	Traffic Engineering IV	15	
	VVR42AI	Transportation Planning IV	15	
PJK41AI	PJK42AI	Project Management: Civil IV	15	
		Total credits for specialist field:	**90**	
		Total credits for other field:	**30**	
		Grand total:	**120**	

4TH YEAR WATER		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1 January	**SEMESTER 2 July**			
	DAM42AI	Dam Engineering IV	15	
HDR41AI		Hydraulics IV	15	
HID41AI		Hydrology IV	15	
	BSP42AI	Irrigation IV	15	
	NWK42AI	Reticulation Design and Management IV	15	
	AFW42AI	Waste Water Treatment Technology IV	15	
WBH41AI		Water Treatment Technology IV	15	
PJK41AI	PJK42AI	Project Management: Civil IV	15	
		Total credits for specialist field:	**90**	
		Total credits for other field:	**30**	
		Grand total:	**120**	

PREREQUISITES

To qualify for admission to the Baccalaureus Technologiae programme, a student must already be in possession of a national diploma, with the specific prescribed instructional offerings as stipulated in the CUT Calendar.

Instructional offerings	Credits	Prerequisite instructional offerings
Asphalt Technology IV	15	Transportation Engineering III
Concrete Technology IV	15	National Diploma
Construction Materials Technology IV	15	Transportation Engineering III or Geotechnical Engineering III
Dam Engineering IV	15	Water Engineering III and Geotechnical Engineering III
Geometric Design IV	15	Transportation Engineering III
Hydraulics IV	15	Water Engineering III
Hydrology IV	15	Water Engineering II & III
Irrigation IV	15	Water Engineering II & III
Pavement Technology IV	15	Transportation Engineering III and Geotechnical Engineering III
Project Management: Civil IV	15	National Diploma
Reticulation Design and Management IV	15	Water Engineering III
Traffic Engineering IV	15	Transportation Engineering III
Transportation Planning IV	15	Transportation Engineering III
Urban Planning and Design IV	15	National Diploma
Waste Water Treatment Technology IV	15	Water Engineering II and III
Water Treatment Technology IV	15	Water Engineering II and III

REMARKS

A student must choose a particular specialist field, provided that he/she complies with the prerequisites thereof. In each specialist field, the learning programme consists of five CORE instructional offerings, plus three from other specialist fields (i.e., a total of eight instructional offerings). The details of learning programmes for the specialist fields are available from the secretary of the relevant department.

Construction Materials Technology IV may not be taken in combination with Concrete Technology IV and/or Asphalt Technology IV.

After successful completion of this qualification, a Baccalaureus Technologiae Degree will be conferred during an official graduation ceremony of CUT.

33.3 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: ELECTRICAL IEBTEG

(This programme will be phased out. The planned last year of intake is 2019. The planned final teach-out date is 2020. The phase-out dates are subject to change.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**120**
MINIMUM CREDITS REQUIRED:	**120**
HEMIS CREDITS	**1.000**
NQF LEVEL:	**7**
DURATION OF LEARNING PROGRAMME:	**1 year full-time or 2 years part-time**

Statement of the purpose of the qualification:

The purpose of the qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent Practising Engineering Technologist. It is intended to subsequently empower the Candidate Engineering Technologist to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving broadly defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;

- make independent decisions or judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technologist (at BTech level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

4TH YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
January	**July**			
REN41AI	REN42AI	Computer Networks IV	12	
DBP41AI	DBP42AI	Database Programming IV	12	
EDG41AI	EDG42AI	Digital Signal Processing IV	12	
EMJ41AI	EMJ42AI	Electrical Machines IV	12	
EBE41AI	EBE42AI	Electrical Protection IV	12	
EKS41AI	EKS42AI	Electronic Communication Systems IV	12	
EKM41AI	EKM42AI	Electronic Communication IV	12	
ELE41AI	ELE42AI	Electronics IV	12	
EIW41AI	EIW42AI	Engineering Mathematics IV	12	
EHV41AI	EHV42AI	High-voltage Engineering IV	12	
EMO41AI	EMO42AI	Microsystems Design IV	12	
EMI41AI	EMI42AI	Microcontroller Systems IV	12	
EPE41AI	EPE42AI	Power Electronics IV	12	
EPS41AI	EPS42AI	Power Systems IV	12	
EBT41AI	EBT42AI	Protection Technology IV	12	
PIG41AI	PIG42AI	Software Engineering IV	12	
SFS41AI	SFS42AI	Software Systems IV	12	
EIP40AI		*Industrial Project IV **(Light Current)**	36	
EIP40HI		*Industrial Project IV **(Heavy Current)**	36	
		Total:	**120**	

PREREQUISITES

Instructional offerings	**Credits**	**Prerequisite instructional offerings**
Computer Networks IV	12	Network Systems III
Database Programming IV	12	Programming III
Digital Signal Processing IV	12	Digital Systems II and Mathematics III
Electrical Protection IV	12	Electrical Protection III
Electrical Machines IV	12	Electrical Machines III
Electronic Communication IV	12	Radio Engineering III
Electronic Communication Systems IV	12	Radio Engineering III
Electronics IV	12	Electronic Applications III
Engineering Mathematics IV	12	Mathematics III
High-voltage Engineering IV	12	Electrical Engineering III

Industrial Projects IV	36	Design Project III
Microcontroller Systems IV	12	Digital Systems III
Microsystems Design IV	12	Digital Systems III
Power Electronics IV	12	Power Electronics III
Power Systems IV	12	Electrical Engineering III and Power Electronics III
Protection Technology IV	12	Electrical Protection III
Software Engineering IV	12	Software Engineering III
Software Systems IV	12	Operating Systems III

REMARKS

*Compulsory instructional offerings.
The total credit value of the theoretical instructional offerings is 120 SAQA credits (1 HEMIS credit). A maximum of 24 SAQA credits (0.2 HEMIS credits) in any other Engineering-related learning programme may be presented.
A student must already be in possession of the National Diploma: Engineering: Electrical, with the specific prescribed instructional offerings as stipulated in the CUT Calendar. Enquiries may be directed to the Head of Department: Electrical, Electronic and Computer Engineering.

Two intakes per year, in January and July.

After successful completion of this qualification, a Baccalaureus Technologiae Degree will be conferred during an official graduation ceremony of CUT.

33.4 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: MECHANICAL IMBTMB

(This programme will be phased out. The planned last year of intake is 2019. The planned final teach-out date is 2020. The phase-out dates are subject to change.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**120**
MINIMUM CREDITS REQUIRED:	**120**
HEMIS CREDITS	**1.000**
NQF LEVEL:	**7**
DURATION OF LEARNING PROGRAMME:	**1 year**

Statement of the purpose of the qualification:

The purpose of this qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent Practising Engineering Technologist. It is intended to subsequently empower the candidate engineering technologist to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving broadly defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technologist (at BTech level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

4TH YEAR		**INSTRUCTIONAL OFFERINGS**	**SAQA CREDITS**	**HEMIS CREDITS**
SEMESTER 1	**SEMESTER 2**			
January	**July**			
MAC41AI		Automatic Control IV	15	
MSM41AI		Strength of Materials IV	15	
MTB41AI		Thermodynamics IV	15	
MTU41AI		Turbo Machines IV	15	
	MFM42AI	Fluid Mechanics IV	15	
	MEM42AI	Mechanics of Machines IV	15	
	MRF42AI	Refrigeration and Air Conditioning IV	15	
	MSA42AI	Stress Analysis IV	15	
MDP40AI		*Engineering Design Project IV	30	
		Total:	**120**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Automatic Control IV	15	Theory of Machines III
Engineering Design Project IV	30	Mechanical Engineering Design III
Fluid Mechanics IV	15	Hydraulic Machines III
Mechanics of Machines IV	15	Theory of Machines III
Refrigeration and Air Conditioning IV	15	Steam Plant III
Strength of Materials IV	15	Applied Strength of Materials III
Stress Analysis IV	15	Applied Strength of Materials III
Thermodynamics IV	15	Steam Plant III
Turbo Machines IV	15	Hydraulic Machines III

REMARKS

Mathematics III is a prerequisite for all the above-mentioned instructional offerings.
*Compulsory instructional offering: Engineering Design Project IV and any two of the following combinations:
Mechanics of Machines IV & Automatic Control IV, **or** Strength of Materials IV & Stress Analysis IV, **or** Thermodynamics IV & Refrigeration and Air Conditioning IV, **or** Fluid Mechanics IV & Turbo Machines IV.

The total credit value of fourth-level theoretical instructional offerings is 120 SAQA credits (1 HEMIS credit).

The degree will be conferred as soon as 120 formal SAQA credits have been earned.

Work-integrated Learning does not form part of the instructional offerings presented from any other approved Engineering programme.

A student must already be in possession of the National Diploma: Engineering: Mechanical, with the specific prescribed instructional offerings as stipulated in the CUT Calendar. Enquiries may be directed to the Head of Department: Mechanical and Mechatronics Engineering.

After successful completion of this qualification, a Baccalaureus Technologiae Degree will be awarded during an official graduation ceremony of CUT.

33.5 BACCALAUREUS TECHNOLOGIAE: INFORMATION TECHNOLOGY (SOFTWARE DEVELOPMENT) BCBTIW (WEB AND APPLICATION DEVELOPMENT) BCBTIP

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 120
MINIMUM CREDITS REQUIRED: 120
HEMIS CREDITS 1.000
NQF LEVEL: 7
DURATION OF LEARNING PROGRAMME: 1 year

Instructional offerings

4TH YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	SEMESTER 2			
CMN41AB		Communication Networks IV	12	
CSY41AB		Computer Security IV	12	
DBS41AB		Database Systems IV	12	
IPE41AB		Internet Programming and e-Commerce IV	12	
NMT11AB		Research Methodology	12	
OPG41AB		Development Software IV	12	
ITM41AB		Information and Technology Management IV	12	
	ACN42AB	Advanced Communication Networks IV	12	
	ADS42AB	Advanced Development Software IV	12	
	APE42AB	Advanced Internet Programming and e-Commerce IV	12	
	BSL42AB	Operating Systems IV	12	
	PIO42AB	Software Engineering and Design IV	12	
	TPG42AB	Technical Programming IV	12	
	USR42AB	User Interfaces Design IV	12	
	CRA42AB	Computer Architecture IV	12	
PRJ40AB		Project IV	24	
		Total:	**120**	

Instructional offerings are presented on demand, depending on the number of students enrolling for such instructional offerings. There is a possibility that a particular instructional offering will not be presented during a specific year.

REMARKS

At least ten theoretical instructional offerings must be taken (Project IV represents two instructional offerings).

Instructional offerings may only be taken during one of the two semesters, with the Department in question determining the instructional offerings for the semester. The student must consult with the relevant Department before finalising his/her instructional offerings.

After successful completion of this qualification, a Baccalaureus Technologiae Degree will be conferred during an official graduation ceremony of CUT.

Admission requirements

An average mark of at least 65% for the final-year subjects of the National Diploma: Information Technology **or** equivalent qualification.

Candidates seeking admission to this learning programme are subject to selection.

Optional instructional offerings

The student should discuss this matter with the relevant Department.

PREREQUISITES

Refer to the heading "General" under point 12 of this chapter.

Instructional offerings	**Credits**	**Prerequisite instructional offerings**
Communication Networks IV	12	System Software II (Semester II)
Computer Security IV	12	National Diploma: Information Technology
Database Systems IV	12	Information Systems III
Internet Programming and e-Commerce IV	12	Internet Programming III
Research Methodology	12	National Diploma: Information Technology
Development Software IV	12	Development Software III
Information and Technology Management IV	12	Information Systems III
Advanced Communication Networks IV	12	Communication Networks IV
Advanced Development Software IV	12	Development Software IV
Advanced Internet Programming and e-Commerce IV	12	Internet Programming and e-Commerce IV
Operating Systems IV	12	National Diploma: Information Technology
Software Engineering and Design IV	12	National Diploma: Information Technology
Technical Programming IV		Technical Programming II
User Interfaces Design IV	12	National Diploma: Information Technology
Computer Architecture IV	12	National Diploma: Information Technology
Project IV	24	National Diploma: Information Technology

Compulsory instructional offerings for the fourth year:

Software Development	**Web and Application Development**
Development Software IV	Internet Programming and e-Commerce IV
Advanced Development Software IV	Advanced Internet Programming and e-Commerce IV
Information and Technology Management IV	Information and Technology Management IV

33.6 BACCALAUREUS TECHNOLOGIAE: QUANTITY SURVEYING ISBTQG

(This programme will be phased out. The planned last year of intake is 2018. The planned final teach-out date is 2020. The phase-out dates are subject to change.)

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**120**
MINIMUM CREDITS REQUIRED:	**120**
HEMIS CREDITS	**1.000**
NQF LEVEL:	**7**
DURATION OF LEARNING PROGRAMME:	**2-year block release** **1 year full-time or two years' part-time block release**

Instructional offerings

4TH YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
BEP40AI	*Building Entrepreneurship IV	20	
COE40AI	*Construction Economics IV	20	
CLP40AI	*Construction Law and Procedures IV	20	
DEM40AI	Development Management IV	20	
MVA40AI	Market Valuations IV	20	
BRK40AI	*Quantity Surveying IV	20	
PRO40AI	Real Estate Management IV	20	
NMD10AI	*Research Methodology I	20	
	Total:	**120**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings **
Building Entrepreneurship IV	20	Construction Accounting III
Construction Economics IV	20	Price Analysis and Estimating III
Construction Law and Procedures IV	20	National Diploma
Development Management IV	20	National Diploma
Market Valuations IV	20	Price Analysis and Estimating III
Quantity Surveying IV	20	Quantity Surveying III
Real Estate Management IV	20	National Diploma
Research Methodology I	20	National Diploma

REMARKS

* Compulsory instructional offerings.
The total credit value of fourth-level theoretical instructional offerings is 120 SAQA credits (1 HEMIS credit).
Six theoretical instructional offerings must be taken at level IV, one of which must be selected from the list above.

**The student must already be in possession of the National Diploma: Building, with the specific prescribed instructional offerings as stipulated in the CUT Calendar. Enquiries may be directed to the Head of Department: Built Environment. A 60% average for the diploma and a 60% average for Quantity Surveying III.

After successful completion of this qualification, a Baccalaureus Technologiae Degree will be conferred during an official graduation ceremony of CUT.

Students following the part-time programme may not be enrolled for more than three subjects in any year of study.

34. BACHELOR'S DEGREES

34.1 BACHELOR OF CONSTRUCTION IN CONSTRUCTION MANAGEMENT B_CON

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 374
MINIMUM CREDITS REQUIRED: 374
HEMIS CREDITS 3.000
NQF LEVEL: 7
DURATION OF LEARNING PROGRAMME: 3 years

Instructional offerings

1ST YEAR	2ND YEAR	3RD YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
DLC5011 DLC5012			Basic Digital Literacy **or** Basic Digital Literacy	0	
COM10BE			Construction Management I	16	
CML10BE			Construction Materials	16	
CNT10BE			Construction Mathematics I	12	
DCT10BE			Design and Construction	16	
ECS10BE			English and Communication Studies	12	
QTS10BE			Quantity Surveying I	16	
RCM10BE			Resident Construction Methods	16	
UDS10BE			Urban Development and Sustainability	16	

1ST YEAR	2ND YEAR	3RD YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
	BGD20BE		Building Services	16	
	CNM20BE		Commercial Construction Methods	16	
	CDL20BE		Construction and Development Law	16	
	COM20BE		Construction Management II	16	
	CTA20BE		Contract Administration	16	
	PGA20BE		Project Planning and Administration	16	
	STC20BE		Structures and Concrete	16	
	UBE20BE		Urban Development Economics	16	
		CAP30BE	Construction Accounting Principles	16	
		COM30BE	Construction Management III	16	
		CPT30BE	Construction Practice Project	16	
		CSG30BE	Construction Surveying	16	
		MSC30BE	Modern Methods of Construction	16	
		PSE30BE	Price Analysis and Estimating	16	
		IWE30BE	Work-integrated Learning	16	
			Total:	**374**	

REMARKS

Admission requirements

For candidates who matriculated in 2007 or before:
A Senior Certificate with at least a minimum of 50% on standard grade or 40% on higher grade in Mathematics, and a minimum of 32 points on the CUT scoring scale.

For candidates who matriculated in 2008 and thereafter:
A National Senior Certificate (NSC) with a minimum score of 32 or more points on the CUT scoring scale, and at least a minimum of 60% to 69% (level 4) in English, Mathematics and Physical Sciences in the Grade 12 examination, or a National Certificate (Vocational) with appropriate subject combinations and levels of achievement, as defined in *Government Gazette Vol. 751, No. 32131* of 11 July 2008 and *Government Gazette Vol. 533, No. 32743* of November 2009. Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

Alternatively, a Higher Certificate or an Advanced Certificate or Diploma in a cognate field may satisfy the minimum admission requirements.

PREREQUISITES

Refer to the heading “General” under point 12 of this chapter.
Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order.

Before progression to any third-year module, the student has to complete all first- and second-year modules successfully.

Instructional offerings	Credits	Prerequisite instructional offerings **
Construction Management II	16	Construction Management I
Commercial Construction Methods	16	Residential Construction Methods
Urban Development Economics	15	Urban Development and Sustainability

34.2 BACHELOR OF CONSTRUCTION IN QUANTITY SURVEYING B_CQS

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 360
MINIMUM CREDITS REQUIRED: 366
HEMIS CREDITS: 3.000
NQF LEVEL: 7
DURATION OF LEARNING PROGRAMME: 3 years

Instructional offerings

1ST YEAR	2ND YEAR	3RD YEAR	INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
DLC5011 DLC5012			Basic Digital Literacy **or** Basic Digital Literacy	0	0.000
COM10BE			Construction Management I	16	
CML10BE			Construction Materials	16	
CNT10BE			Construction Mathematics I	12	
DCT10BE			Design and Construction	16	
ECS10BE			English and Communication Studies	12	
QTS10BE			Quantity Surveying I	16	
RCM10BE			Resident Construction Methods	16	
UDS10BE			Urban Development and Sustainability	16	
	BGD20BE		Building Services	16	
	CNM20BE		Commercial Construction Methods	16	
	CDL20BE		Construction and Development Law	16	
	CTA20BE		Contract Administration	16	
	PGA20BE		Project Planning and Administration	16	
	PTG20BE		Procurement and Tendering	16	
	QTS20BE		Quantity Surveying II	16	
	UBE20BE		Urban Development Economics	16	
		CAP30BE	Construction Accounting Principles	16	
		CSG30BE	Construction Surveying	16	
		MSC30BE	Modern Methods of Construction	16	
		PSE30BE	Price Analysis and Estimating	16	
		QTS30BE	Quantity Surveying III	16	
		QSP30BE	Quantity Surveying Practice Project	16	
		IWE30BE	Work-integrated Learning	30	
			Total:	**374**	

REMARKS

Admission requirements

Admission to this learning programme is subject to selection.

For candidates who matriculated in 2007 or before:
A Senior Certificate with at least a minimum of 50% on standard grade or 40% on higher grade in Mathematics, and a minimum of 32 points on the CUT scoring scale.

For candidates who matriculated in 2008 and thereafter:
A National Senior Certificate (NSC) with a minimum score of 32 or more points on the CUT scoring scale, and at least a minimum of 60% to 69% (level 4) in English, Mathematics and Physical Sciences in the Grade 12 examination, or a National Certificate (Vocational) with appropriate subject combinations and levels of achievement, as defined in *Government Gazette Vol. 751, No. 32131* of 11 July 2008 and *Government Gazette Vol. 533, No. 32743* of November 2009. Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

Alternatively, a Higher Certificate or an Advanced Certificate or Diploma in a cognate field may satisfy the minimum admission requirements.

In addition to the general admission requirements, the candidate must be in possession of an NSC with endorsement for a bachelor's degree. A minimum mark of 50% in Life Sciences/Physiology, Mathematics and Physical Sciences is required. A minimum of 32 points on the CUT scale of notation is also required.

PREREQUISITES

Refer to the heading "General" under point 12 of this chapter.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order.

Before progression to any third-year module, the student has to complete all first- and second-year modules successfully.

Instructional offerings	**Credits**	**Prerequisite instructional offerings ****
Commercial Construction Methods	16	Residential Construction Methods
Quantity Surveying II	16	Quantity Surveying I
Urban Development Economics	16	Urban Development and Sustainability

34.3 BACHELOR OF ENGINEERING TECHNOLOGY IN CIVIL ENGINEERING B_CVLE

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 420
MINIMUM CREDITS REQUIRED: 420
HEMIS CREDITS: 3.000
NQF LEVEL: 7
DURATION OF LEARNING PROGRAMME: 3 years

Instructional offerings

1ST YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1		SEMESTER 2				
January	July	January	July			
LCS5011	LCS5012			Academic Literacy and Communication Studies	14	
BDL11A	BDL11B			Basic Digital Literacy	14	
CED11A	CED11B			Engineering Drawings I	14	
CMA11A	CMA11B			Engineering Mathematics I	14	
CPH11A	CPH11B			Physics	14	
		CCE12B	CCE12A	Civil Construction Engineering I	14	
		CED12B	CED12A	Engineering Drawings II	14	
		CMA12B	CMA12A	Engineering Mathematics II	14	
		CEM11B	CEM11A	Engineering Mechanics I	14	
		CGM12B	CGM12A	Geomatics I	14	
				Total:	**140**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
CCE21A	CCE21B			Construction Engineering II	14	
CMA21A	CMA21B			Engineering Mathematics III	14	
OGM21A	OGM21B			Geomatics II	14	
CSA21A	CSA21B			Structural Analysis I	14	
CUD21A	CUD21B			Urban Planning and Design	14	
		CEH22B	CEH22A	Engineering Hydrology	14	
		CPR22B	CPR22A	Engineering Project Management	14	
		CGE22B	CGE22A	Geotechnical Engineering I	14	
		CSA22B	CSA22A	Structural Analysis II	14	
		CPT22B	CPT22A	Transportation Planning and Traffic Engineering	14	
				Total:	**140**	

3RD YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 5		SEMESTER 6				
January	July	January	July			
CDS31A	CDS32B			Design of Structures I	14	
CEH31A	CEH31B			Engineering Hydraulics	14	
CGE31A	CGE31B			Geotechnical Engineering II	14	
CPJ31Ab	CPJ31B			Project (year module)	14	
CRT31A	CRT31B			Road and Transportation Engineering	14	
		CDS32B	CDS32A	Design of Structures II	14	
		CPJ32B	CPJ32A	Project (year module)	14	
		CRD32B	CRD32A	Road Design	14	
		CSS32B	CSS32A	Water Supply and Sanitation Engineering	14	
		CWS32B	CWS32A	Water Resources Systems Analysis	14	
				Total:	**140**	

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Academic Literacy and Communication Studies	14	Grade 12
Construction Engineering I	14	Grade 12
Construction Engineering II	14	Construction Engineering I
Design of Structures I	14	Structural Analysis II
Design of Structures II	14	Structural Analysis II
Digital Literacy I	14	Grade 12
Engineering Drawings I	14	Grade 12
Engineering Drawings II	14	Engineering Drawings I
Engineering Hydraulics	14	Engineering Mathematics II and Engineering Mechanics I
Engineering Hydrology	14	Engineering Mathematics II
Engineering Mathematics I	14	Grade 12
Engineering Mathematics II	14	Engineering Mathematics I
Engineering Mathematics III	14	Engineering Mathematics I
Engineering Mechanics I	14	Physics I
Engineering Project Management	14	Construction Engineering I
Geomatics I	14	Engineering Mathematics I
Geomatics II	14	Geomatics I
Geotechnical Engineering I	14	Construction Engineering II
Geotechnical Engineering II	14	Geotechnical Engineering I
Physics	14	Engineering Mathematics I
Project	14	Engineering Mathematics I
Road Design	14	Construction Engineering II and Transportation Planning & Traffic Engineering
Road and Transportation Engineering	14	Geomatics I & Construction Engineering II

Structural Analysis I	14	Engineering Mechanics I
Structural Analysis II	14	Structural Analysis I
Transportation Planning and Traffic Engineering	14	Geomatics I & Urban Planning and Design
Urban Planning and Design	14	Engineering Drawings II
Transportation Planning and Traffic Engineering	14	Engineering Mathematics I
Water Supply and Sanitation Engineering	14	Engineering Hydraulics
Water Resources Systems Analysis	14	Grade 12

REMARKS

All instructional offerings shown are compulsory.
The total credit value of all instructional offerings **must** add up to 420.

Two intakes per year, in January and July. The first year intake for this programme is the first semester of 2018.

Work-integrated Learning does not form part of the instructional offerings.
After successful completion of this qualification, the Bachelor of Engineering Technology in Civil Engineering will be awarded during an official graduation ceremony of CUT.

Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order. A distinction (75% or more) in instructional offering A ensures exemption from instructional offering B. A pass (without distinction) means that the student must pass instructional offering B in order to meet the prerequisite for the learning programme. Failing instructional offering A means that the student must re-register for instructional offering A in a subsequent semester.

No student will be allowed to graduate without successfully completing the following instructional offerings: Academic Literacy and Communication Studies; Personal Information Management; and Reading Skills.

Admission requirements:

For candidates who matriculated in 2007 and before:

- A Grade 12 National Senior Certificate (NSC) with a score of 32 or higher on the CUT scoring scale, plus the following:
  - a minimum mark of 50% on standard grade or 40% on higher grade in both Physical Sciences and English; and
  - a minimum mark of 60% on standard grade or 50% on higher grade in Mathematics.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2007 or before. Mathematical Literacy will not be accepted in any of the Engineering disciplines.

For candidates who matriculated in 2008 and thereafter:

- Candidates with a Grade 12 National Senior Certificate and a minimum score of 32 points on the CUT scoring scale, plus a minimum mark of 50% to 59% (level 4) in both English and Physical Sciences, and a minimum mark of 60% to 69% (level 5) for Mathematics, may be admitted directly to the programme. Mathematical Literacy will not be accepted in any of the Engineering disciplines.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2008 or thereafter.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate. Candidates must also adhere to the general admission regulations for candidates who completed the N3, N4, N5 and N6 qualification at a Technical Vocational Education and Training (TVET) college.

34.4 BACHELOR OF ENGINEERING TECHNOLOGY IN MECHANICAL ENGINEERING B_MEC

This learning programme will be offered in Bloemfontein.

SAQA CREDITS:	**420**
MINIMUM CREDITS REQUIRED:	**420**
HEMIS CREDITS:	**3.000**
NQF LEVEL:	**7**
DURATION OF LEARNING PROGRAMME:	**3 years**

Statement of the purpose of the qualification:

The purpose of this qualification is to build the necessary knowledge, understanding and skills required for a student's progression towards becoming a competent Practising Engineering Technologist. It is intended to subsequently empower the Candidate Engineering Technologist to demonstrate his/her ability to apply his/her acquired knowledge, understanding, skills, attitudes and values in the South African work environment. The qualification is also designed to add value to the qualifying student in terms of personal enrichment, as well as status and recognition.

A person in possession of this qualification is able to do the following:

- competently apply an integration of theory, principles, proven techniques, practical experience and appropriate skills towards solving broadly defined problems in the field of Engineering, whilst operating within the relevant standards and codes;
- demonstrate well-rounded general engineering knowledge, as well as systematic knowledge of the main terms, procedures, principles and operations of one of the disciplines of Engineering;
- gather evidence from primary sources and journals using advanced retrieval skills, and also organise, synthesise and present the information professionally in a mode appropriate to the audience;
- apply the acquired knowledge to new situations, both concrete and abstract, in the workplace or community;
- identify, analyse, conduct and manage a project;
- make independent decisions/judgements, taking into account the relevant technical, economic, social and environmental factors;
- work both independently and as a member of a team, and also as a team leader;
- relate engineering activity to health and safety, as well as environmental, cultural and economic sustainability;
- meet the requirements for registration with the Engineering Council of South Africa as a Candidate Engineering Technologist (at BEngTech level); and
- demonstrate the capacity to explore and exploit educational, entrepreneurial and career opportunities, and to engage in professional development.

Instructional offerings

1ST YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1		SEMESTER 2				
January	July	January	July			
LCS5011	LCS5012			Academic Literacy and Communication Studies	14	
BDL11A	BDL11B			Basic Digital Literacy	14	
MEM11A	MEM11B			Engineering Mathematics I	14	
MEP11A	MEP11B			Engineering Physics I	14	
MWP11A	MWP11B			Manufacturing and Workshop Practice I	14	
PIM5011	PIM5012			Personal Information Management	0	
		MEC12B	MEC12A	Engineering CAD Drawing I	14	
		MMA12B	MMA12A	Engineering Materials I	14	
		MEM12B	MEM12A	Engineering Mathematics II	14	
		MAM12B	MAM12A	Machines Mechanics I	14	
		MTF12B	MTF12A	Thermofluids I	14	
				Total:	**140**	

2ND YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 3		SEMESTER 4				
January	July	January	July			
MDE21A	MDE21B			Engineering Design II	14	
MEM21A	MEM21B			Engineering Mathematics II	14	
MST21A	MST21B			Engineering Strength of Materials II	14	
MTF21A	MTF21B			Thermofluids II	14	
MAM21A	MAM21B			Machine Mechanics II	14	
		MET212B	MET22A	*Electrical Technology II	14	
		MDE22B	MDE22A	Engineering Design III	14	
		MEN22B	MEN22A	Energy Technology III	14	
		MMF22B	MMF22A	*Engineering Manufacturing II	14	
		MPR22B	MPR22A	Engineering Project Management	14	
		MAM22B	MAM22A	Machine Mechanics III	14	
				Total:	**140**	

*Elective

3RD YEAR				INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 5		SEMESTER 6				
January	**July**	**January**	**July**			
MET31A	MET31B			*Electronical Technology III	14	
MDP31A	MDP31B			Engineering Design Project	14	
MMF31A	MMF31B			*Engineering Manufacturing III	14	
MSF31A	MST31B			Engineering Strength of Materials III	14	
MFS31A	MFS31B			Fluid Science III	14	
MTS31A	MTS31B			Thermal Science III	14	
		MCS32B	MCS32A	Control Systems III	14	
		MDP32B	MDP32A	Engineering Design Project	14	
		MHM32B	MHM32A	Hydrodynamic Machines III	14	
		MRF32B	MRF32A	Refrigeration III	14	
		MSA32B	MSA32A	Structural Analysis III	14	
				Total:	**140**	

*Elective.

PREREQUISITES

Instructional offerings	Credits	Prerequisite instructional offerings
Academic Literacy and Communication Studies	14	Grade 12
Control Systems III	14	Machine Mechanics III
Digital Literacy I	14	Grade 12
Electrical Technology II	14	Energy Physics I
Electrical Technology III	14	Electrical Technology II
Energy Technology III	14	Engineering Physics I
Engineering CAD Drawing I	14	Grade 12
Engineering Design II	14	Engineering CAD Drawing I
Engineering Design III	14	Engineering Design II
Engineering Design Project	14	Engineering Design III
Engineering Design Project (Semester 2)	14	Engineering Design Project (Semester 1)
Engineering Manufacturing II	14	Engineering Materials I
Engineering Manufacturing III	14	Engineering Manufacturing II
Engineering Materials I	14	Grade 12
Engineering Mathematics I	14	Grade 12
Engineering Mathematics II	14	Mathematics I
Engineering Mathematics III	14	Engineering Mathematics II
Engineering Physics I	14	Grade 12
Engineering Project Management	14	Academic Literacy and Communication Studies
Engineering Strength of Materials II	14	Engineering Materials I
Engineering Strength of Materials III	14	Engineering Strength of Materials II
Fluid Science III	14	Thermofluids II
Hydrodynamic Machines III	14	Thermofluids II
Machine Mechanics I	14	Engineering Physics I
Machine Mechanics II	14	Machine Mechanics I
Machine Mechanics III	14	Machine Mechanics II

Manufacturing and Workshop Practice I	14	Grade 12
Refrigeration III	14	Thermofluids II
Structural Analysis III	14	Engineering Strength of Materials III
Thermal Science III	14	Thermofluids II
Thermofluids I	14	Engineering Physics I
Thermofluids II	14	Thermofluids I

REMARKS

All instructional offerings in the first year are compulsory. In the second year, the student must choose between Engineering Manufacturing II and Electrical Technology II, and follow through the subsequent semester with Engineering Manufacturing III or Electrical Technology III, respectively.

The total minimum credit value of all instructional offerings is 420 SAQA credits.
The degree will be issued upon completion of 420 SAQA credits.
Work-integrated Learning does not form part of the instructional offerings.

Students may not simultaneously enrol for subjects spanning more than two academic semesters. For example: A student may enrol for Semester 2 and Semester 3 subjects simultaneously, but may then not enrol for any Semester 1 or Semester 4 subjects.

Students may not enrol for subjects that involve timetable clashes.

<u>For candidates who matriculated in 2007 and before</u>:

- A Grade 12 National Senior Certificate (NSC) with a score of 32 or higher on the CUT scoring scale, plus the following:
  - a minimum mark of 50% on standard grade or 40% on higher grade in both Physical Sciences and English; and
  - a minimum mark of 60% on standard grade or 50% on higher grade in Mathematics.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2007 or before. Mathematical Literacy will not be accepted in any of the Engineering disciplines.

<u>For candidates who completed the NSC in 2008 and thereafter</u>:

- Candidates with a Grade 12 National Senior Certificate and a minimum score of 32 points on the CUT scoring scale, plus a minimum mark of 50% to 59% (level 4) in both English and Physical Sciences, and a minimum mark of 60% to 69% (level 5) for Mathematics, may be admitted directly to the programme. Mathematical Literacy will not be accepted in any of the Engineering disciplines.
- Candidates must also adhere to the general admission regulations for candidates who matriculated in 2008 and thereafter.
- Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate. Candidates must also adhere to the general admission regulations for candidates who completed the N3, N4, N5 and N6 qualification at a Technical Vocational Education and Training (TVET) college.

34.5 BACHELOR OF SCIENCE IN HYDROLOGY AND WATER RESOURCES MANAGEMENT BSHWRM

This learning programme will be offered in Bloemfontein.

SAQA CREDITS: 360
MINIMUM CREDITS REQUIRED: 366
HEMIS CREDITS: 3.000
NQF LEVEL: 7
DURATION OF LEARNING PROGRAMME: 3 years

Instructional offerings

1ST YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
LCS5011	LCS5012	Academic Literacy and Communication Studies	12	
DLC5001		Digital Literacy	6	
NMR5111		Numeracy	6	
CHE5011		Chemistry	12	
PYC5011		Physics	12	
	AMM5012	Applied Mathematics	12	
	HYD5012	Hydrology I	12	
	WTM5012	Water Resources Management I	12	
	EVS5012	Environmental Science	12	
		Total:	**96**	

2ND YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
HDC6000		Hydro Chemistry*	24	
GHR6000		Geo-hydrology*	24	
HYD6000		Hydrology II*	30	
WTM6000		Water Resources Management II*	30	
	EVM6022	Environmental Engineering	18	
	WIL6022	Work-integrated Learning (general)	10	
		Total:	**136**	

3RD YEAR		INSTRUCTIONAL OFFERINGS	SAQA CREDITS	HEMIS CREDITS
SEMESTER 1	**SEMESTER 2**			
HYD7000		Hydrology III*	30	
WTM7000		Water Resources Management III*	30	
AWT7000		Advanced Water and Waste Water Treatment Technology*	24	
WIL7000		Work-integrated Learning (in elective)	20	
WTC7000 RDM7000		Water Pollution Control# **or** Reticulation Design and Management#	30#	
		Total:	**134**	

*** Year subjects**
 # Elective: Students are required to take one of the two electives.

REMARKS

- Only one intake per year, in January.
- All theoretical instructional offerings indicated with an asterisk (*) are year subjects, whilst those indicted with a hash (#) are electives.

Admission requirements

Admission to this learning programme is subject to selection.

For candidates who matriculated in 2007 and before:
In addition to the general admission requirements, a minimum mark of 50% on SG or 40% on HG in Biology/Physiology, Mathematics and Physical Sciences is required. A minimum admission point score (APS) of 28 points on the CUT scale of notation is also required.

For candidates who completed the National Senior Certificate in 2008 and thereafter:
In addition to the general admission requirements, the candidate must be in possession of an NSC with endorsement for a bachelor's degree. A minimum mark of 50% in Life Sciences/Physiology, Mathematics and Physical Sciences is required. A minimum APS of 28 points on the CUT scale of notation is also required.

Applicants in possession of the National Certificate Vocational (NCV) will be selected according to the selection requirements as approved by Senate.

PREREQUISITES

Refer to the heading "General" under point 12 of this chapter.
Academic Literacy and Communication Studies requires the successful completion of two instructional offerings, A and B, in this specific order.

Instructional offerings	Credits	Prerequisite instructional offerings
Environmental Engineering	12	Environmental Science
Geo-hydrology	12	Hydrology I
Hydro Chemistry	12	Chemistry

Hydrology II	12	Hydrology I
Hydrology III	30	Hydrology II
Water Resources Management II	12	Water Resources Management I
Water Resources Management III	30	Water Resources Management II

35. MAGISTER TECHNOLOGIAE DEGREES

SAQA CREDITS: 120
HEMIS CREDITS: 1.000
NQF LEVEL: 9

PROGRAMME CODE	MAGISTER TECHNOLOGIAE	MAIN CODE	INSTRUCTIONAL OFFERINGS
ISMTLL	Engineering: Civil ***Offered at: Bloemfontein*** **NO INTAKE IN 2018**	VER50AI	Dissertation
IEMTEA	Engineering: Electrical ***Offered at: Bloemfontein*** **NO INTAKE IN 2018**	VHA50AI	Dissertation
IMMTMF	Engineering: Mechanical ***Offered at: Bloemfontein*** **NO INTAKE IN 2018**	VHD50AI	Dissertation
BCMTIG	Information Technology ***Offered at: Bloemfontein*** **NO INTAKE IN 2018**	VER50AB	Dissertation

REMARKS

After successful completion of this qualification, a Magister Technologiae degree will be conferred during an official graduation ceremony of CUT.

Admission requirements

Research follows specialisation at Baccalaureus Technologiae level or equivalent.
Excellent assessment results at Baccalaureus Technologiae level or equivalent, as required.

36. MASTER'S DEGREES

SAQA CREDITS: 180
HEMIS CREDITS: 1.000
NQF LEVEL: 9

PROGRAMME CODE	MASTER'S DEGREE	MAIN CODE	INSTRUCTIONAL OFFERINGS
M_ENGC	Master of Engineering in Civil Engineering ***Offered at: Bloemfontein***	VER50AI	Dissertation
M_ENGE	Master of Engineering in Electrical Engineering ***Offered at: Bloemfontein***	VHA50AI	Dissertation
M_ENGM	Master of Engineering in Mechanical Engineering ***Offered at: Bloemfontein***	VHD50AI	Dissertation
M_ITEC	Master of Information Technology ***Offered at: Bloemfontein***	VER50AB	Dissertation

REMARKS

After successful completion of this qualification, a master's degree will be conferred during an official graduation ceremony of CUT.

Admission requirements

Research follows specialisation at Baccalaureus level or equivalent.
Excellent assessment results at Baccalaureus level or equivalent, as required.

37. DOCTOR TECHNOLOGIAE DEGREES

SAQA CREDITS: 240
HEMIS CREDITS: 2.000
NQF LEVEL: 10

PROGRAMME CODE	DOCTOR TECHNOLOGIAE	MAIN CODE	INSTRUCTIONAL OFFERINGS
ISDTSB	Engineering: Civil ***Offered at: Bloemfontein*** **NO INTAKE IN 2018**	GVN90AI	Advanced research project and thesis
IEDTEK	Engineering: Electrical ***Offered at: Bloemfontein*** **NO INTAKE IN 2018**	NAV90AI	Advanced research project and thesis
IMDTMJ	Engineering: Mechanical ***Offered at: Bloemfontein*** **NO INTAKE IN 2018**	GNA90AI	Advanced research project and thesis
BCDTTG	Information Technology ***Offered at: Bloemfontein*** **NO INTAKE IN 2018**	ARD90AB	Advanced research project and thesis

REMARKS

After successful completion of this qualification, a Doctor Technologiae degree will be conferred during an official graduation ceremony of CUT.

Admission requirements

Research follows specialisation at Magister Technologiae level or equivalent.
Excellent assessment results at Magister Technologiae level or equivalent, as required.

38. DOCTORAL DEGREES

SAQA CREDITS: 240
HEMIS CREDITS: 2.000
NQF LEVEL: 10

PROGRAMME CODE	DOCTORATE	MAIN CODE	INSTRUCTIONAL OFFERINGS
D_ENGC	Doctor of Engineering in Civil Engineering ***Offered at: Bloemfontein***	GVN90AI	Advanced research project and thesis
D_ENGE	Doctor of Engineering in Electrical Engineering ***Offered at: Bloemfontein***	NAV90AI	Advanced research project and thesis
D_ENGM	Doctor of Engineering in Mechanical Engineering ***Offered at: Bloemfontein***	GNA90AI	Advanced research project and thesis

REMARKS

After successful completion of this qualification, a doctorate will be conferred during an official graduation ceremony of CUT.

Admission requirements

Research follows specialisation at Master of Engineering, Magister Technologiae level or equivalent.
Excellent assessment results at Master of Engineering, Magister Technologiae level or equivalent, as required.

39. DOCTOR OF PHILOSOPHY

SAQA CREDITS: 240
HEMIS CREDITS: 2.000
NQF LEVEL: 10

PROGRAMME CODE	DOCTORATE	MAIN CODE	INSTRUCTIONAL OFFERINGS
D_ITEC	Doctor of Philosophy in Information Technology ***Offered at: Bloemfontein***	ARD90AB	Advanced research project and thesis

40. POSTDOCTORAL STUDIES

PROGRAMME CODE	POSTDOCTORAL STUDIES	MAIN CODE	INSTRUCTIONAL OFFERING
POSTDH	Postdoctoral Studies ***Offered at: Bloemfontein***	RESENGI	Research Engineering

41. REGISTRATION AS A PROFESSIONAL TECHNICIAN AND/OR TECHNOLOGIST WITH THE ENGINEERING COUNCIL OF SOUTH AFRICA (ECSA)

ECSA is a statutory body established by an Act of Parliament, and is responsible for setting and controlling the standards of education, training and conduct of engineering professionals.

Graduate students of CUT may register for the following titles, according to qualifications attained and specified years of suitable experience in the field of Engineering:

* Professional Engineering Technician (PrTechniEng)
  Students who qualified with a DipEngTech must first obtain work experience according to ECSA requirements.
* Professional Engineering Technologist (PrTechEng)

For further information in this regard, contact:

Engineering Council of South Africa
Water View Corner Building
2 Ernest Oppenheimer Avenue
Bruma Lake Office Park
BRUMA
2198

Telephone number (direct): (011) 607 9500
Fax number: (011) 607 9589

42. REGISTRATION AS A PROFESSIONAL QUANTITY SURVEYOR OR CONSTRUCTION MANAGER WITH THE RELEVANT PROFESSIONAL BODY

Statutory bodies established by an Act of Parliament are responsible for setting and controlling the standards of education, training and conduct of Quantity Surveyors and Construction Managers, respectively, for both professions.

Further information on the registration process is available from the respective professional bodies.