DUT
DURBAN UNIVERSITY OF TECHNOLOGY

FACULTY OF ENGINEERING & THE BUILT ENVIRONMENT

2016 HANDBOOK
CIVIL ENGINEERING (MIDLANDS)

HANDBOOK FOR 2016

FACULTY OF ENGINEERING AND THE BUIILT ENVIRONMENT

DEPARTMENT of CIVIL ENGINEERING

Pietermaritzburg

MISSION STATEMENT

As a progressive department, our mission is to contribute innovatively to the socio-economic development of South Africa by:

Offering a portfolio of relevant programmes

- Producing well-rounded graduates who are attuned to the needs of the profession
- Generating, integrating and applying knowledge to stimulate socio-economic development
- Partnering stake holders in sustainable development
- Acting as an incubator for advanced study in clearly defined areas of strength
- Being student centered and quality driven
- Providing an enabling environment for continued staff development.

VISION OF THE DEPARTMENT OF CIVIL ENGINEERING

To be a quality driven department of Civil Engineering that provides a well-rounded, professional education that ensures that graduates are innovative and have a competitive edge.

What is a University of Technology?
A university of technology is characterized by being research informed rather than research driven where the focus is on strategic and applied research that can be translated into professional practice. Furthermore, research output is commercialized thus providing a source of income for the institution. Learning programmes, in which the emphasis on technological capability is as important as cognitive skills, are developed around graduate profiles as defined by industry and the professions.

QUALIFICATION PURPOSE

The purpose of The National Diploma: Engineering: Civil is to train civil engineering technicians who will meet the criteria for registration as a candidate professional technician by the Engineering Council of South Africa (ECSA), and who will display competence as part of the engineering team in the execution of technical tasks under remote supervision by using and applying their knowledge in independent judgement in the identification and solution of civil engineering problems.

The purpose of the Baccalaureus Technologiae: Engineering: Civil is to train civil technologists who will meet the criteria for registration as a candidate professional technologist by the Engineering Council of South Africa (ECSA), in the chosen field of specialisation. The technologist, by a combination of education, training and experience, will be able to display a high level of technical competence and ethical conduct, which enable them to apply engineering principles and techniques independently to problems of varying complexity within their specialist discipline.

On analysis, the purpose as outlined here has good alignment with the institutional mission and vision statements. Students qualifying with these qualifications have little or no problem in gaining meaningful employment and with the construction boom that the country has experienced over the last few years, they are much in demand.

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IMPORTANT NOTICE

The departmental rules in this handbook must be read in conjunction with the Durban University of Technology's General Rules contained in the current General Handbook for Students

NOTE TO ALL REGISTERED STUDENTS

Your registration is in accordance with all current rules of the Institution. If, for whatever reason, you do not register consecutively for every year/semester of your programme, your existing registration contract with the Institution will cease. Your re-registration anytime thereafter will be at the discretion of the Institution and, if permitted, will be in accordance with the rules applicable at that time.

1. CONTACT DETAILS

All departmental queries to:

Secretary:	Mrs Nicky Erasmus
Telephone No:	033 845 9000
Fax No:	033 845 8941
Location of Department:	Administrative Building, F J Sithole Road, Imbali, Pietermaritzburg

All academic administrative queries to:

Faculty officer:	Mrs Vineta Hornby
Telephone No:	033 845 8818
Fax No:	033 845 8840
Location of Student Administration:	Block D, Riverside Campus, Pietermaritzburg

Executive Dean:	Prof Theo Andrews
Telephone No:	031 373 2720
Fax No:	031 373 2724
Location of Executive Dean's office:	Block S6 Level 4, Steve Biko Campus

2. STAFFING

Head of Department	Mr T W McKune, Pr Tech (Eng); M Dip Tech (CE) (TN); GDE(UN); HFSAICE
Lecturers	Mr D D de Kock, B. Tech, MEnv Dev (UKZN), AMSAICE
	Mrs L de Villiers, BSc Hons (Math) (Unisa) Contract
	Mr S Hay, Pr Tech Eng M. Tech (CE) (DUT) MSAICE
	Mr M. Patrick (N. Dip. Indust. Design) AMSAICE Contract
	Mr P. Perumal MSc (Maths) (UN) AMSAICE
	Mr S F E Pienaar (N.Dip Mat) (Pret), BSc (Geol) (UN) AMSAICE Contract
	Mr O Rowe, B.Tech (Sur) (DIT) MEnv Dev (UKZN), AMSAICE
	Mr D. Stuart, B. Tech (Sur) (DIT) MBE (Sur) (DUT) AMSAICE
Technical Assistant	Mr N. Dladla, N Dip Civil (DUT) AMSAICE
	Mr N E Hlalukane, N Dip Civil (DUT) AMSAICE
	Mr M Letyeka, B Tech (IT) (DUT)
	Mr E O Tchakubuta, B. Tech (CE) (DUT) AMSAICE
General Assistant	Mr S Mtshali

3. PROGRAMMES OFFERED BY THE DEPARTMENT

Programmes are offered in this Department which, upon successful completion, lead to the award of the following qualifications:

Qualification	SAQA NLRD Number
National Diploma: Engineering: Civil	72226
B. Tech: Engineering: Civil	72128
M. Eng	96827
Master of Built Environment	96844
D. Eng	96812

4. PROGRAMME INFORMATION AND RULES

On the basis of a variety of placement assessments, successful applicants for study towards a National Diploma will be accepted into the three-year minimum programme of study. An Engineering Access programme is also available for applicants who do not automatically meet the entrance requirements for the National Diploma programme.

MINIMUM ADMISSION REQUIREMENTS
NATIONAL DIPLOMA: ENGINEERING: CIVIL

In addition to the relevant General Rules pertaining to Registration (e.g. Rules G3, G4, G5, G6, G7, G8, G9 & G10); persons must, as a minimum, have obtained the following Senior Certificate, or equivalent, subject results:

- Maths & Science (E) on Higher Grade, or (C) on Standard Grade and a pass in English. In addition a learner must obtain a minimum of a total score of 35 when using the following scoring system for Senior Certificate subject results in order to be accepted into the programme.

Scoring system: Using the table below determine the scores associated with each Senior Certificate subject result obtained, multiply the mathematics and science scores by two and add all the scores together to obtain a total.

Symbol	A	B	C	D	E	F
Higher Grade	8	7	6	5	4	3
Standard Grade	6	5	4	3	2	1

Thereafter selection is made at the full discretion of the Head of the Department, based on the senior certificate or equivalent results and the number of students, which the department can accommodate during any one registration period. An interview may also be required.

For students who matriculate with the NSC Rating:
In addition to the relevant General Rules pertaining to Registration (eg. Rules G3-G10); learners must, as a minimum, have obtained the following NSC, or equivalent, subject results:

	Result
Mathematics	4 (Adequate achievement)
Science	4 (Adequate achievement)
English (Primary)	4 (Adequate achievement)
English (First additional)	4 (Adequate achievement)

In addition, a learner must obtain a minimum of a total score of 28 when using the following scoring system for NSC subject results in order to be conditionally accepted into the programme.

Scoring system: using the table below, determine the scores associated with each NSC subject result obtained, multiply the mathematics and science scores by two and add all the scores together to obtain a total.

NSC Rating Code	7	6	5	4	3	2	1
Score	7	6	5	4	3	2	1

No points are allocated for the subject "Life Orientation"

Thereafter, selection is made at the full discretion of the Head of Department based on a number of factors including class size, venue size, etc.
Or
National Technical Certificate (N4) with passes at 50% in four (4) relevant subjects including Engineering Mathematics and Engineering Science or an equivalent SAQA NQF Level 4 qualification, as well as compliance with the English language requirements as stated in the General rules.

For students who matriculate with NCV Level 4 Rating (FET)
A student must have obtained a 60% or higher pass in all of the following subjects;

English
Life Orientation
Mathematics
Physical Science or equivalent
Plus two vocational subjects

Note: This Department only considers 1st and 2nd choice CAO applicants.

BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL

Every candidate for this qualification shall have:

1. completed the requirements for the National Diploma: Engineering: Civil or the National Higher Diploma: Civil Engineering or have been granted confer-ment of status of one of these qualifications
   and

2. completed a minimum of one year of appropriate experience in the desired field of specialization (this may include experience gained whilst undertaking experiential learning) if a former student of the Durban University of Technology, and three years of appropriate post diploma experience in the desired field of specialization if from another institution.

Note:

Applicants in possession of the National Higher Diploma: Civil Engineering will be required to have passed the subjects as listed below according to the selected specialist field:

Construction Management	Theory of Management IV or equivalent
Geotechnical	Soil Mechanics T4 Engineering Geology T2
Structural	Theory of Structures T4 Structural Design T4
Transportation/Urban	Road & Rail Const. & Design T4 Civil Eng. Documentation T4
Water	Water & Waste Water Eng. T4

EC2 GENERAL RULES

Except where otherwise laid down in Rules EC3 to EC9 and in the rules for specific instructional programmes, the General Rules for all courses shall apply to instructional programmes in this department.

EC3 REGISTRATION

In addition to the General Rules pertaining to Registration a student whose fees are being paid by an employer shall provide a letter of authority to this effect.

EC4 ENTRANCE REQUIREMENTS

In addition to the General Rules pertaining to Entrance Requirements specific requirements apply to both of the revised instructional programmes offered in this department and these are set out in the rules for the instructional programmes.

EC5 WORK DONE DURING THE SEMESTER

In addition to Rule G12 the following specific rules apply to all subjects:

1. The determination of the year/semester mark, where applicable, for each subject for the purpose of issuing a certificate in terms of the General Rules is indicated with the syllabus for each subject.
2. A student who for any reason is absent from a particular practical or laboratory practical/test, must provide proof of his/her reason for absence to the particular lecturer concerned in accordance with Rule EC10. Failure to do so will result in a zero mark being recorded for the practical or laboratory practical/test.

3. In the case where a subject is evaluated by a continuous or 100% course work system, then any student failing to obtain a final result of 50% or higher, and any sub-minimum stipulated for such subject, will have to repeat that subject.
4. Where a subject year mark has a project or practical component, then the mark for such component may not be carried over to a subsequent semester where the subject is failed, unless so stipulated in the subject specific rules.

EC6 CONDUCT OF STUDENT IN LABORATORY

Rules of conduct pertaining to the specific laboratory, as approved by the department, shall apply to all students registered for the particular subject.

EC7 SUPPLEMENTARY EXAMINATIONS

The provisions as contained in the General Rules will apply to all examinable subjects in this department.

EC8 PROMOTION TO HIGHER LEVEL

For each of the programmes in this department standard subject combinations for the semesters of University attendance (semesters 1, 2, 5 and 6) are prescribed in the Programme Structure (see section 5).

In addition to the requirements of the General Rules no student shall be permitted to register:

(a) for any second level subject (ie S2) when more than three subjects from the standard first semester subject combination are outstanding;

(b) for any subject of the standard fifth semester subject combination (i.e S3) when more than three subjects from the standard first and second semester subject combination (ie S1 & S2) are outstanding and at least Module 1 (EXC1211) of experiential learning has been passed.

(c) for any subject of the standard sixth semester subject combination (i.e. S4) when more than three subjects from the standard first, second and fifth semester subject combination (i.e. S1, S2 & S3) are outstanding and at least six months of experiential learning (EXC1221) has not been done.

(d) furthermore, students who are repeating a subject will only be offered a place subject to the availability of space where laboratory or specialised equipment is involved.

Note:

Students transferring from other institutions and entering the programme at second semester level or higher will be accepted only if they have already passed all of the subjects from the first semester level (ie the standard S1). Students who have already passed Drawing II at another institution will be required to undergo and pass a proficiency test before they will be granted an exemption from the subject or be permitted to register for any of the standard fifth or sixth semester subjects. A student who applies for admission through

the CAO, and who has completed equivalent subjects through another tertiary institution will only be granted an exemption if prior disclosure of these subjects has been made and confirmation thereof has been given in writing by the departmental HOD.

EC9 MINIMUM INSTRUCTIONAL PROGRAMME

Notwithstanding anything to the contrary in the General Rules, the minimum instructional programme for each qualification in this department shall be as set out under the rules for that instructional programme.

EC10 SPECIAL TESTS

A special test may be granted by the Head of Department to a student who has been prevented from taking a test:

(1) by illness on the day of the test or immediately before it, provided that he submits a medical certificate **on the prescribed form** on which a medical practitioner, registered by the Health Professions Council of SA, homoeopath or chiropractor, registered with the South African Associated Health Board, specifies the nature and duration of illness and that for health reasons it was impossible or undesirable for the student to sit for the test, and that he submits such certificate to the head of department on the day as determined by the practitioner that the student should return to lectures immediately following such illness, or on one of the two following working days;

or

(2) by circumstances which in the opinion of the head of department were beyond his control at the time of the test provided that satisfactory evidence of such circumstances is provided. Such circumstances shall not include:

(i) any misinterpretation by him of the date, time or venue of the test,

(ii) transportation difficulties, where his residential term time address is within the area serviced by a scheduled bus or commuter train service to the central Pietermaritzburg area, and provided otherwise that he informs the head of department of such difficulty prior to the time of commencement of the test,

(iii) failure by him to bring to the test venue any equipment normally required for that subject as specified in the study guide for the particular subject.

For the purpose of this rule test shall mean any written, oral or practical test, set for the purpose of determining or contributing towards a semester mark for a subject, and shall include tests set for subjects which are evaluated by continuous evaluation.

Any student who misses a test and who does not qualify for a special test, and any student who qualifies for a special test but fails to write it, shall be awarded a zero mark for the missed test.

Special tests for all subjects shall be written within the last two weeks of official lectures of each semester and may be based on the entire semesters work.

EC11 REFUSAL OF RE-REGISTRATION

11.1 A student who fails any subject for the first time shall be placed on an academic warning and may be allowed to re-register with special conditions.

11.2 A student who has not successfully completed any subject after two periods of registration for that subject shall only be permitted to re-register full-time for that subject at the discretion of the Departmental Appeal Committee.

11.3 A student who has been refused permission to re-register for a subject in terms of Rule 11.2 will not be permitted to register for any other subject in that qualification. A student will thereby be unable to complete the qualification unless the outstanding subjects are attended and passed at another institution and exemptions granted in accordance with the General Rules.

11.4 A student who has not completed the National Diploma within five years of the first registration (including experiential learning), may be refused permission to register, or, at the discretion of the Departmental Appeal Committee, may be accepted subject to special conditions.

11.5 A student wishing to appeal to the Faculty Board of Engineering and the Built Environment against the application of this rule must submit to the Faculty Officer a statement in which he/she explains the reasons for his/her appeal. This appeal must be submitted to the Faculty Officer within five (5) University working days of being officially notified in writing that he/she has not been permitted to re-register. No appeals will be considered after this.

11.6 Where a student has appealed against exclusion in terms of these rules or rule G17, and such appeal has been refused, then said student may not submit a further appeal until the conditions of the refused appeal have been fully met.

EC12 EXPERIENTIAL LEARNING

This programme requires the student/candidate to undergo a period of experiential learning as part of the course. All prescribed compulsory and elective subjects (instructional offerings) and the prescribed experiential component must be passed in order to obtain sufficient credits to qualify for the qualification.

Although the University undertakes to assist the student/candidate in obtaining suitable experiential learning placement, the onus is on the student/candidate to find an employer. The employer must be accredited by the University for the purposes of experiential learning. An experiential learning agreement

creates a separate contract between the employer and the student/candidate. All students must register with the University within two weeks of commencement of all in-service/experiential learning or after changing employer. A student may not register for the second/third module of Experiential Learning until he/she has satisfied all the requirements for the first/second module. It is the students responsibility to ensure that the University appointed mentor is contacted regarding conducting a work based interview during the experiential learning period for Module 2 (EXCI221) and 3 (EXCI301).

EC13 LATE REGISTRATION

13.1 No student will be permitted to register for any subject offered by this department later than one week after the official commencement of full-time semester lectures. Students who have not registered within this time frame will only be permitted to register in the subsequent semester.

13.2 No student will be permitted to add or delete any subject later than one week after the commencement of full-time semester lectures, except where the result of a supplementary examination has delayed such change or addition, or as a result of an administrative error by the University.

EC14 TIMETABLE CLASHES

No student will be permitted to register for any subject combination where there will be any timetable or test clashes. In the event of there being a clash then the student will be required to register for the subject from the lowest level of the qualification for which they are registering.

Furthermore, it is the students' responsibility to check prior to registration that there are no clashes as no special arrangements will be made to accommodate such instances. In the event of a student missing a test/practical/deadline as a result of a clash a zero mark will be awarded for that component of the work missed.

EC15 STUDENT DRESS

Students must be neat and tidy at all times. Closed shoes and protective clothing must be worn for the duration of the time spent in any departmental laboratory. Appropriate safety equipment needs to be worn where applicable, or as detailed in the laboratory practical manual. Students are required to adhere to the provisions of the Occupational Health and Safety Act at all times.

EC16 ACCESS TO DEPARTMENTAL COMPUTER LABORATORIES

No student is permitted to have access to any of the dedicated departmental computer laboratories unless he/she has been granted the necessary authority to do so, and:

16.1 the subject lecturer or an approved departmental tutor is present;

or

16.2 the Departmental Computer Technician is present;

EC17 COMPETENCY MODULES

Where a subject comprises more than one module, and one of the modules includes a competency based assessment, then such competency module **must** also be passed before a student will be permitted to register for any subject for which the modularized subject is a prerequisite.

EC18 AWARDING OF DIPLOMA/DEGREE

18.1. Diplomas/Degrees are not automatically awarded to candidates who have satisfied all of the requirements for each instructional programme. The onus is on the student to apply to the University for the award of the Diploma/Degree. In this regard the candidate should obtain the necessary forms from the Secretary of the Department.

18.2. Duly completed experiential learning log books, reports and any other documentation must accompany the application. Alternate documentation may be submitted to the Department for approval.

18.3. A certified copy of a valid identity document must be attached to the diploma application.

5. PROGRAMME STRUCTURE

5.1 NATIONAL DIPLOMA: ENGINEERING: CIVIL

The instructional programme shall have a minimum duration of four (4) semesters of full-time study and two (2) semesters of experiential learning and shall consist of the subjects listed below.

Code	Subjects	C/O	Semester	Assessment Method	NQF	Pre-requisite
AMCN101	Applied Mechanics I	C	First	3hr Exam	5	
CNSM101	Construction Materials I	C	First	Continual	5	
CPTR112	Computer Skills I (module 1)	C	First	Continual	5	
CPTR122	Computer Skills I (module 2)	C	First	Continual	5	
DWIN101	Drawing I	C	First	Continual	5	
MATH102	Mathematics I	C	First	Continual	5	
SRVY112#	Surveying I (Module 1)	C	First	3hr Exam	5	
SRVY122	Surveying I (Module 2)	C	First	Skills Test	5	
CCTS101	Communication Skills IA	C	Second	Continual	5	
CMTD101	Construction Methods I	C	Second	3hr Exam	5	
DWIN201	Drawing II	C	Continual	Continual	5	DWIN101 CPTR112
MNCV101	Management: Civil I	C	Second	3hr Exam	5	
MATH202	Mathematics II	C	Second	Continual	6	MATH102
SRVC211#	Surveying: Civil II (Module 1)	C	Second	Continual	5	SRVY101
SRVC221	Surveying: Civil II (Module 2)	C	Second	Continual	5	SRVY101
THRS201	Theory of Structures II	C	Second	3hr Exam	6	AMCN101
EXCI211#	Engineering Practice II (Module 1)	C	First			
EXCI221	Engineering Practice II (Module 2)	C	*Third & Fourth			EXCI211
EXCI301	Engineering Practice II (Module 3)	C	*Third & Fourth			EXCI221
GTCE201	Geotechnical Engineering II	C	Fifth	3hr Exam	6	CNSM101 or CMTD101 and EXCI211
MNCV211#	Management: Civil II (Module 1)	C	Fifth	3hr Exam	6	MNCV101 and EXCI211
MNCV221	Management: Civil II (Module 2)	C	Fifth	Control Test	6	MNCV101 and EXCI211
STAL211#	Structural Analysis II (Module 1)	C	Fifth	3hr Exam	6	THRS201and EXCI211

STAL221	Structural Analysis II (Module 2)	C	Fifth	Control Test	6	THRS201and EXCI211
SSTM311#	Structural Steel & Timber Design III (Module 1)	C	Fifth	4hr Exam (re-stricted open book)	6	THRS201 and EXCI211
SSTM321	Structural Steel & Timber Design III (Module 2)	C	Fifth	Control Test	6	THRS201and EXCI211
TRNE211#	Transportation Engineering II (Module 1)	C	Fifth	3hr Exam	6	EXCI211
TRNE221	Transportation Engineering II (Module 2)	C	Fifth	Control Test	6	DWIN101and EXCI211
WTRE211	Water Engineering II (Module 1 - Hydraulics)	C	Fifth	3hr Exam	6	MATH202 and THRS201 and EXCI211

Code	**Subjects**	**C/O**	**Semester**	**Assessment Method**	**NQF**	**Pre-requisite**
WTRE221	Water Engineering II (Module 2 - Public Health)	C	Fifth	2hr Exam	6	MATH202 and THRS201 and EXCI211
DCMT311#	Documentation III (Module 1)	C	Sixth	4hr Exam (re-stricted open book)	6	MNCV201 and EXCI221
DCMT321	Documentation III (Module 2)	C	Sixth	Control Test	6	MNCV20 and EXCI221
GTCE311#	Geotechnical Engineering III (Module 1)	C	Sixth	3hr Exam	6	GTCE201 and EXCI221
GTCE321	Geotechnical Engineering III (Module 2)	C	Sixth	Control Test	6	GTCE201 and EXCI221
RCMS311#	Reinforced Concrete & Masonry Design III (Module 1)	C	Sixth	4hr Exam (re-stricted open book)	6	STAL201 and EXCI221
RCMS321	Reinforced Concrete & Masonry Design III (Module 2)	C	Sixth	Control Test	6	STAL201 and EXCI221
STAL311#	Structural Analysis III (Module 1)	C	Sixth	3hr Exam	6	STAL201 and EXCI221
STAL321	Structural Analysis III (Module 2)	C	Sixth	Control Test	6	STAL201 and EXCI221
TRNE311#	Transportation Engineering III (Module 1- Theory)	C	Sixth	2hr Exam	6	TRNE201 and EXCI221
TRNE321	Transportation Engineering III (Module 2 - Calcs)	C	Sixth	2hr Exam	6	TRNE201 and EXCI221
TRNE331	Transportation Engineering III (Module 3)	C	Sixth	Control Test	6	TRNE201 and EXCI221
WTRE313#	Water Engineering III (Module 1 - Hydrology)	C	Sixth	3hr Exam	6	WTRE201 and EXCI221
WTRE323	Water Engineering III (Module 2 -Hydraulics)	C	Sixth	3hr Exam	6	WTRE201 and EXCI221
WTRE333	Water Engineering III (Module 3)	C	Sixth	Control Test	6	WTRE201 and EXCI221

C= Compulsory : O = Optional

\# Denotes that the subject is modularlised and comprises one or more theoretical and a proficiency module, in which case the proficiency module must also be passed to register for any subject for which the modularized subject is a prerequisite in accordance with Rule EC17.

* Civil Engineering Practice II need not necessarily consist of two consecutive semesters, nor need it necessarily involve the third and fourth semesters. However, all students must attend at least one academic semester before registering for Module Two of Civil Engineering Practice II.

Furthermore a student may not register for the fifth semester (S3) unless Module 1 of experiential learning has been completed and for the sixth semester (S4) unless at least Module 2 of experiential learning has been completed.

Diploma Phase-out Plan
(As approved by the University Senate on 26 August 2015)

This current National Diploma, which is based on SAPSE 151, shall be phased out to allow for the introduction of new qualifications which must comply with the requirements of the new Higher Education Qualifications Sub-Framework. This programme will be removed from the PQM after phase out, and will be replaced by the Diploma in Technology in Civil Engineering.

The last cohort will be enrolled in January 2016, contingent upon the department being given permission to offer the Diploma in Technology in Civil Engineering as of January 2017.

Notwithstanding all the current rules (both General rules and Departmental Rules) that regulate this diploma, the last semester in which any student may register for each of the subjects is listed as follows:

Subject Name	Last Possible Semester of Registration
Applied Mechanics I	January 2017
Computer Skills I (Module 1)	January 2017
Computer Skills I (Module 2)	January 2017
Construction Materials I	January 2017
Drawing I	January 2017
Mathematics I	January 2017
Mathematics I (Module 1)	January 2017
Mathematics I (Module 2)	January 2017
Surveying I (Module 1)	January 2017
Surveying I (Module 2)	January 2017
Communication Skills I	January 2018
Construction Methods I	January 2018
Drawing II	January 2018
Management Civil I	January 2018
Surveying (Civil) II (M1)	January 2018
Surveying (Civil) II (M2)	January 2018
Mathematics II	January 2018
Geotechnical Engineering II	January 2019
Management (Civil) II (M1)	January 2019
Management (Civil) II (M2)	January 2019
Structural Analysis II (M1)	January 2019
Structural Analysis II (M2)	January 2019
Structural Steel & Timber Design III (M1)	January 2019
Structural Steel & Timber Design III (M2)	January 2019
Transportation Engineering II (M1)	January 2019
Transportation Engineering II (M2)	January 2019
Water Engineering II (Hydraulics) (M1)	January 2019
Water Engineering II (Public Health) M2)	January 2019
Documentation III (M1)	January 2020
Documentation III (M2)	January 2020
Geotechnical Engineering III (M1)	January 2020
Geotechnical Engineering III (M2)	January 2020
Reinforced Concrete & Masonry Design III (M1)	January 2020
Reinforced Concrete & Masonry Design III (M2)	January 2020
Structural Analysis III (M1)	January 2020
Structural Analysis III (M2)	January 2020
Transportation Engineering III (M1)	January 2020

Transportation Engineering III (M2)	January 2020
Transportation Engineering III (M3)	January 2020
Water Engineering III (Hydrology) (M1)	January 2020
Water Engineering III (Hydraulics) (M2)	January 2020
Water Engineering III (M3)	January 2020
Civil Engineering Practice II (Module 1)	January 2018
Civil Engineering Practice II (Module 2)	January 2019
Civil Engineering Practice III	January 2021

The dates stated in this rule are subject to change depending on the effective approval date for the new HEQF aligned programmes.

5.2 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL

This instructional programme has a minimum duration of four (4) semesters and is only available on a part-time basis and may be offered in four specialist options listed below:

A student may not change disciplines or campuses during the course of his/her B. Tech studies without prior permission from the HOD.

A student will be required to pass the Theoretical and project module of a subject to obtain a credit for the subject. This need not necessarily happen in the same semester, but the project module cannot be registered for unless the theory is concurrently registered or has already been passed.

Where a student fails the project module, but obtains a mark of 45% or more, such student will be permitted to re-submit the project for re-assessment within a minimum stipulated period. Should the final result of such re-submitted project be a pass, then the student will be awarded a mark of 50% irrespective of the mark achieved.

Construction Management Discipline

Students who wish to register with ECSA will be required to do three (3) engineering subjects from any of the other specialist disciplines. Project Management (Civil) IV is a compulsory subject for this option.

Code	Subjects	C/O	Assessment Method	NQF
CTRM411	Contract Management: Civil IV (Module 1 - Theory)	C	3 hr exam - restricted open book	7
CTRM421	Contract Management: Civil IV (Module 2 - Project)	C	100% year mark	7
IDRN211	Industrial Relations & Negotiation II (Module 1 - Theory)	C	3 hr exam - restricted open book	7
IDRN221	Industrial Relations & Negotiation II (Module 2 - Project)	C	100% year mark	7
MPPC411	Management Principles & Practice IV (Module 1 - Theory)	C	3 hr exam	7
MPPC421	Management Principles & Practice IV (Module 2 - Project)	C	100% year mark	7
PREM311	Principles of Management Economics III (Module 1 - Theory)	C	3 hr exam	7
PREM321	Principles of Management Economics III (Module 2 - Project)	C	100% year mark	7
PRCV411	Project Management: Civil IV (Module 1 - Theory)	C	3 hr exam	7
PRCV421	Project Management: Civil IV (Module 2 - Project)	C	100% year mark	7

Plus any three electives from the other specialist disciplines.

Geotechnical Discipline (not offered by DUT)
Structural Discipline (currently only available in Durban)
Transportation Discipline

GMTD411	Geometric Design IV (Module 1 Theory)	C	4 hr exam – restricted open book	7
GMTD421	Geometric Design IV (Module 2 Project)	C	100% year mark	7
PVMT411	Pavement Technology IV (Module 1 Theory)	C	3 hr exam	7
PVMT421	Pavement Technology IV (Module 2 Project)	C	100% year mark	7
TFEN411	Traffic Engineering IV (Module 1 Theory)	C	3 hr exam	7
TFEN421	Traffic Engineering IV (Module 2 Project)	C	100% year mark	7
TRNP411	Transport Planning IV (Module 1 Theory)	C	3 hr exam	7
TRNP421	Transport Planning IV (Module 2 Project)	C	100% year mark	7
TRNT411	Transportation Technology IV (Module 1 Theory)	C	3 hr exam	7
TRNT421	Transportation Technology IV (Module 2 Project)	C	100% year mark	7

Plus any three electives from the other specialist disciplines.

Urban Engineering Discipline

CSTM411	Construction Materials Technology IV (Module 1 Theory)	C	3 hr exam	7
CSTM421	Construction Materials Technology IV (Module 2 Project)	C	100% year mark	7
GMTD411	Geometric Design IV (Module 1 Theory)	C	4 hr exam – restricted open book	7
GMTD421	Geometric Design IV (Module 2 Project)	C	100% year mark	7
PVMT411	Pavement Technology IV (Module 1 Theory)	C	4 hr exam – restricted open book	7
PVMT421	Pavement Technology IV (Module 2 Project)	C	100% year mark	7
RDMN411	Reticulation Design & Management IV (Module 1 Theory)	C	3 hr exam	7
RDMN421	Reticulation Design & Management IV (Module 2 Project)	C	100% year mark	7
SLWM411	Solid Waste Management IV (Module 1 Theory)	C	3 hr exam	7
SLWM421	Solid Waste Management IV (Module 2 Project)	C	100% year mark	7
UPLD411	Urban Planning & Design IV (Module 1 Theory)	C	3 hr exam	7
UPLD421	Urban Planning & Design IV (Module 2 Project)	C	100% year mark	7

Plus any two electives from the other specialist disciplines.

Water Engineering Discipline

HYDL411	Hydraulics IV (Module 1 Theory)	C	3 hr exam	7
HYDL421	Hydraulics IV (Module 2 Project)	C	100% year mark	7
HDLY411	Hydrology IV (Module 1 Theory)	C	3 hr exam	7
HDLY421	Hydrology IV (Module 2 Project)	C	100% year mark	7
RDMN411	Reticulation Design & Management IV (Module 1 Theory)	C	3 hr exam	7
RDMN421	Reticulation Design & Management IV (Module 2 Project)	C	100% year mark	7
WSTT411	Waste Water Treatment Technology IV (Module 1 Theory)	C	3 hr exam	7
WSTT421	Waste Water Treatment Technology IV (Module 2 Project)	C	100% year mark	7
WTRT411	Water Treatment Technology IV (Module 1 Theory)	C	3 hr exam	7
WTRT421	Water Treatment Technology IV (Module 2 Project)	C	100% year mark	7

Plus any three electives from the other specialist disciplines.

Note:

1. A total of eight subjects must be selected from those listed above, such that at least five subjects are selected from the chosen specialist option, and such that a minimum of four subjects are at Level IV.
2. Construction Materials Technology IV may not be selected in combination with Concrete Technology IV and/or Asphalt Technology IV.

3. Not all of the specialist options and not all of the subjects within those options will necessarily be available at any particular time.

5.3 MAGISTER of ENGINEERING

ENTRANCE REQUIREMENTS

Every candidate for this qualification shall have:

1. completed the requirements for the BEng Hons;

   Or

2. *have completed a post graduate Diploma in Civil Engineering Technology,*

   Or

3. have been granted a conferment of status for the above-mentioned qualification.

INSTRUCTIONAL PROGRAMME

This is a research-based qualification requiring advanced studies on behalf of the student in any subject/s related to the specific field of study. Students are required to undertake research under the guidance of a supervisor.
(*Amended wef 2015/08)*

5.4. MASTER OF THE BUILT ENVIRONMENT

ENTRANCE REQUIREMENTS

Every candidate for this qualification shall have:

1. completed the requirements for the BEng Hons in Geomatics;

or

2. have been granted a conferment of status for the above-mentioned qualification.

INSTRUCTIONAL PROGRAMME

This is a research-based qualification requiring advanced studies on behalf of the student in any subject/s related to the specific field of study. Students are required to undertake research under the guidance of a supervisor.
(*Amended wef 2015/08)*

5.5 DOCTOR OF ENGINEERING

ENTRANCE REQUIREMENTS

Every candidate for this qualification shall have:

1. completed the requirements for the MEng

or

2. have been granted a conferment of status for the above-mentioned qualification.

INSTRUCTIONAL PROGRAMME

This is a research-based qualification requiring advanced studies on behalf of the student in any subject/s related to the specific field of study. Students are required to undertake research under the guidance of a supervisor.
(*Amended wef 2015/08)*

5.6 ENGINEERING ACCESS PROGRAMME ENTRANCE REQUIREMENTS

1.1. Students who do not meet the entrance requirements for the National Diploma programme, will be considered for the Engineering Access programme, the following minimum requirements (or their equivalent) shall apply:

1.2 **Senior Certificate**	**SG**	**NSC**
Mathematics	E	3
Science	E	3
English	Pass	4

1.3 have obtained an N3 or equivalent Certificate with passes (>50%) in four approved subjects (two of which must be Mathematics and Science) and have passed one of the official languages at least on First Language Standard Grade and the other official language at least on Second Language Standard Grade.

INSTRUCTIONAL PROGRAMME

The instructional programme shall have a duration of one semester of full-time study, and shall consist of the subjects listed below.

FCMS10P Communications Skills IA
FCPS10P Computer Skills I
FMTH10P Foundation Mathematics I
FSCI10P Foundation Science

A student is required to pass **all** subjects from the Engineering Access programme to guarantee access to the National Diploma: Engineering: Civil. In this event credits for Communication Skills IA, Computer Skills I and Mathematics I will be granted. Should a student intend to register for any other Engineering programme, then they will be required to apply in writing to the HOD of that programme for access from the Engineering Access programme.

No student will be permitted to register for the National Diploma: Engineering: Civil from the Engineering Access Programme where they have not settled the cost of the Access programme in full. A student will only be permitted to attempt the access programme once.

6. ASSESSMENT RULES

The method of assessment for each subject/module is indicated in the indicative content (see section 8).

See also General Rules G12 to G16

7. RE-REGISTRATION RULES

See Rule EC11

8. INDICATIVE CONTENT

NOTE:

1. Except where otherwise stated all subjects have a required sub-minima of 40% of the overall semester mark and 40% of the examination mark respectively.
2. The allocation of periods for each module is based on a contact time of 50 minutes with classes commencing at 60 minute intervals.

APPLIED MECHANICS I (AMCN101) (081001312)

Theory: 3 periods per week
Tutorial: 1 period per week
Practical: 1 period per week
Semester Mark: Two tests - 15% each
Practical - 10%

NOTE:
A student who fails the subject but obtains a mark of 40% or more in the practical will be permitted to carry the practical mark for one subsequent re-registration.

Examination: One three-hour paper - 60%

SYLLABUS

1. Statics and hydrostatics
2. Kinematics
3. Kinetics

COMMUNICATION SKILLS I (CCTS101) (129900312) (Serviced subject)

Theory: 1 period per week
Tutorial: 1 periods per week.
Course Mark: One theoretical test - 33,33%
Two oral tests - 16.67% each
Three other tests - 11,11% each

SYLLABUS

1. Communication theory
2. Oral presentation
3. Technical writing
4. Group communication skills

COMPUTER SKILLS I MODULE 1 (CPTR112/CPSA112) (060205512)

Theory: 2 periods per week
Tutorial: 1 periods per week
Semester Mark: Four practical tests
- Computer utilization - 10%
- Operating systems - 15%
- Spreadsheets and word processing - 40%

Control test - 35% (sub-minimum of 14%, i.e. 40% of 35%)
Examination: No examination

SYLLABUS

1. Introduction and Computer Utilisation
2. Hardware

3. Operating Systems - Windows
4. Application Packages
   - Spreadsheets
   - Word Processing
   - Presentations

COMPUTER SKILLS I MODULE 2 (CPTR122/CPSA122) (060205512)

Practical: 2 periods per week
Semester Mark: 100% - The semester mark is made up of a number of computer based numeracy tests subminimum of 90% is required to pass the module.
Examination: No examination

CONSTRUCTION MATERIALS I (CNSM101) (080613312)

Theory: 3 periods per week
Practical: 1 period per week
Semester Mark: Three tests - 25% each
Four practicals - 6,25% each
Examination: No examination

SYLLABUS

1. Materials and laboratory
2. Quarries
3. Material codes

CONSTRUCTION METHODS I (CMTD101) (080613412)

Theory: 3 periods per week
Semester Mark: Two tests - 20% each
Students will be required to undertake library research on selected topics and questions on this research will constitute 50% of the second test
Examination: One three-hour paper - 60%

SYLLABUS

1. Environmental Awareness
2. Safety
3. Construction methods
4. Building Practice
5. Construction plant
6. Codes and Building Regulations

CONSTRUCTION MATERIALS TECHNOLOGY IV MODULE 1 THEORY (CSTM411) (0806107060)

Theory: 4 periods per week
Semester Mark: Two tests - 20,00 % each
Examination: One three-hour paper - 60%

SYLLABUS

1. Concrete technology
2. Asphalt & Bitumen technology
3. Other materials
4. Testing

CONSTRUCTION MATERIALS TECHNOLOGY IV MODULE 2 PROJECT (CSTM421) (0806107060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

CONTRACT MANAGEMENT (CIVIL) IV MODULE 1 THEORY (CNTM411) (20426707)

Theory: 4 periods per week
Semester Mark: Two tests - 20 % each

Examination: One four-hour paper - 60% (open book)

SYLLABUS

1. Contract Documentation
2. Contract Specifications
3. Pre-Tender Procedures
4. Tender Preparation
5. Tender Award
6. Commencement of Contract/Project
7. Measurement and Payment
8. Subcontract Work
9. Contractual Dispute Management
10. Cost Control and Productivity
11. Quality Management

CONTRACT MANAGEMENT (CIVIL) IV MODULE 2 PROJECT (CNTM421) (20426707)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

DOCUMENTATION III - MODULE 1 (DCMT311)

Theory: 3 periods per week
Tutorial: 1 period per week
Semester Mark: One test - 13,33%
Two assignments - 13,33% each
Examination: One four-hour paper - 60% (restricted open book)

SYLLABUS

1. Quantities
2. Specifications
3. Estimating
4. Computer applications
5. Conditions of contract

DOCUMENTATION III - MODULE 2 (DCMT321)

Practical: 1 period per week
Semester Mark: Two Computer competency assignments - 50% each (subminimum of 25% - ie 50% on each)
Examination: No examination

SYLLABUS

The student will be required to be able to demonstrate a suitable standard of competency in selected design software packages and will cover the following aspects:

1. Preparing of typical Civil Engineering estimates
2. Extracting of quantities for earthworks and pipe works projects using digital terrain models
3. Determining of quantities for Civil Engineering structures
4. Compiling of schedules of quantities using SABS 1200 and COLTO

DRAWING I (DWIN101) (080609012)

Theory: 3 periods per week.
Practical: 1 periods per week
Semester Mark: Three drawing assignments - 12% each
One test - 24%
One Control test - 40% (sub-minimum of 50% of 40% i.e. 20% for control test)
Examination: No examination

SYLLABUS

1. Drawing office practice
2. Draughtsmanship skills
3. General drawing applications

DRAWING II (DWIN201) (080609222)

Theory: 3 periods per week
Tutorial: 1 period per week
Semester Mark: Three assignments - 20% each
One control test - 40% (a subminimum of 60% is required for this control test - i.e. 24% of 40%)
Examination: No examination

SYLLABUS

1. Structural Engineering applications
2. Civil Engineering applications
3. Computer applications where applicable

ENGINEERING: PRACTICE: CIVIL II - MODULE 1 (EXCI211)

Theory: 3 periods per week
Compulsory attendance of life skills lectures in the following topics - Credit Value two (2) weeks.

SYLLABUS

1. Communicating clearly
2. Managing time
3. Making decisions
4. Delegating successfully
5. Motivating people

6. Managing teams
7. Managing meetings
8. Presenting successfully
9. Negotiating successfully
10. Interviewing people
11. Managing change
12. Managing stress
13. Obtaining a Learners Drivers Licence (Students with a valid learners or drivers licence will be exempted from this component.)

ENGINEERING PRACTICE: CIVIL II - MODULE 2 (EXCI221)

At least 24 weeks of experiential learning under the supervision of a qualified member in four or more of the following categories of Civil Engineering work:

SYLLABUS

1. Administration
2. Drawing
3. Surveying
4. Design
5. Contracts
6. Construction
7. Materials testing

And the submission of a technical report on the experience gained.

ENGINEERING: PRACTICE: CIVIL III - (EXCI301)

At least 24 weeks of experiential learning under the supervision of a qualified member in four or more of the following categories of Civil Engineering work:

SYLLABUS

1. Administration
2. Drawing
3. Surveying
4. Design
5. Contracts
6. Construction
7. Materials testing

And the completion of industry based engineering investigation which may be orally assessed.

GEOMETRIC DESIGN IV MODULE 1 THEORY (GMTD411) (0806111060)

Theory:	4 periods per week	
Semester Mark:	Two tests	- 20% each
Examination:	One 4-hour paper	- 60% (restricted open book)

SYLLABUS

1. Principles & practice of Road Alignment
2. Environmental impact control
3. Design control and criteria
4. Elements of design (Geometrics, Safety)
5. Intersection & interchange design
6. Drainage design
7. Earthworks design

GEOMETRIC DESIGN IV MODULE 2 PROJECT (GMTD421) (0806111060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

GEOTECHNICAL ENGINEERING II (GTCE201) (15056822)

Theory: 3 periods per week
Practical: 1 period per week
Semester Mark: Two tests - 14%
Practical assignment - 12%
Examination: One three-hour paper - 60%

SYLLABUS

1. Introduction to geology
   - 1.1 Minerals and rocks
   - 1.2 Physical geology
   - 1.3 Structural geology
   - 1.4 S A stratigraphy
   - 1.5 Geological maps
2. Engineering geology
3. Engineering soils

GEOTECHNICAL ENGINEERING III - MODULE 1 (GTCE311)

Theory: 3 periods per week
Practical: 1 period per week
Semester Mark: Two tests - 12% each
Practical - 16%
Examination: One three-hour paper - 60%

SYLLABUS

1. Soil mechanics
   - 1.1 Water in soils
   - 1.2 Stability and strength
2. Site investigation

GEOTECHNICAL ENGINEERING III - MODULE 2 (GTCE321)

Practical: 1 period per week
Semester Mark: Computer competency assignments - 60%
Control Test - 40% (subminimum of 20% ie 50% of 40%)
Examination: No examination

SYLLABUS

The student will be required to be able to demonstrate a suitable standard of competency in selected software packages and will cover the following aspects:

1. Flow net modelling
2. Bearing capacities of soils
3. Foundation design
4. Slope stability analysis

HYDRAULICS IV MODULE 1 THEORY (HYDL411) (0806112060)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Hydrodynamics
2. Hydraulic machinery (Pumps, Turbines, etc.)
3. Hydraulic models
4. Open channel hydraulics
5. Fluvial hydraulics
6. Wave hydraulics

HYDRAULICS IV MODULE 2 PROJECT (HYDL421) (0806112060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

HYDROLOGY IV MODULE 1 THEORY (HDLY411) (0806113060)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Introduction to meteorology
2. Groundwater
3. Surface water
4. Flood analysis
5. Water resources analysis
6. South African hydrology

HYDROLOGY IV MODULE 2 PROJECT (HDLY421) (0806113060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

INDUSTRIAL RELATIONS & NEGOTIATIONS II MODULE 1 THEORY (IDRN211) (0411062220)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each (restricted open book)
Examination: One three-hour paper - 60% (restricted open book)

SYLLABUS

1. Industrial relations
2. Negotiations and dispute handling in:
   - Contractor/Client & Contractor/Sub-contractor relations
   - Contractor/Professional team relations
   - Contractor/Supplier relations
   - Management/Personnel relations
   - Project Manager/Other Parties relations
3. Strike management

INDUSTRIAL RELATIONS & NEGOTIATIONS II MODULE 2 PROJECT (IDRN221) (0411062220)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

MANAGEMENT: CIVIL I (MNCV101) (040905612)

Theory: 3 periods per week
Semester Mark: Two tests - 20,00% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Composition of the Civil Engineering industry
2. Parties involved in the construction process
3. Types of contracts
4. Theory of management
5. Office and site organisation
6. Productivity
7. Quality management
8. Elementary economic concepts
9. Basic accounting applications

MANAGEMENT: CIVIL II - MODULE 1 (MNCV211)

Theory: 3 periods per week
Semester Mark: Two tests - 20%each
Examination: One three-hour paper - 60%

SYLLABUS

1. Contract planning
2. Planning techniques
3. Financial planning and control
4. Computer applications
5. Labour legislation

MANAGEMENT: CIVIL II - MODULE 2 (MNCV221)

Practical: 1 period per week
Semester Mark: Computer competency assignments- 60%
Control Test - 40% (subminimum of 20% ie 50% of 40%)
Examination: No examination

SYLLABUS

The student will be required to be able to demonstrate a suitable standard of competency in selected software packages and will cover the following aspects:

1. Preparing a precedence network
2. Preparing Gantt charts and histograms
3. Cost analysis - assigning costs
4. Creating calender charts
5. Adjusting schedules
6. Levelling of resources
7. Tracking progress - creating baseline programs
8. Reporting - progress

MANAGEMENT PRINCIPLES & PRACTICE IV MODULE 1 THEORY (MPPC411) (0409226060)

Theory: 4 periods per week
Semester Mark: 2 tests - 20% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Management approaches
2. The business environment
3. The functions of management
4. Decision making & problem solving
5. Strategic management
6. Management by objectives
7. Corporate communications
8. Small business management
9. International management
10. Politics, ethics and social responsibility
11. Case studies

MANAGEMENT PRINCIPLES & PRACTICE IV MODULE 2 PROJECT (MPPC421) (0409226060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

MATHEMATICS 1 (MATH102 & FMTH10P) (160404012) (Serviced subject)

Theory: 3 periods per week
Tutorial: 2 periods per week

Continuous Assessment: The best 2 out of 3 class tests and/or assignments will be converted to a mark out of 20. Two control tests will each count 40 (i.e.2 x 40 = 80). A subminimum of 16% (ie 40% of 40%) is required for each of the control tests.
The final result will be the sum of the above out of 100. A final result of 50 or more is required to pass Mathematics 1.

Note:

A full-time student who obtained a FINAL RESULT of between 45% and 49% will be allowed to write a special 3-hour make-up test covering the whole syllabus during the week after semester examinations end. If the mark obtained is used in place of the major test marks and this results in the student passing, a final result of 50% will be allocated.

MATHEMATICS 1 (MTHA112 & FMTA111) (Module 1) (160404012) (Serviced subject)

Theory: 3 periods per week
Tutorial: 2 periods per week

Continuous Assessment: The best 2 out of 3 class tests and/or assignments will be converted to a mark out of 20. Two control tests will each count 40 (i.e.2 x 40 = 80). A subminimum of 16% (ie 40% of 40%) is required for each of the control tests.
The final result will be the sum of the above out of 100. A final result of 50 or more is required to pass Mathematics 1.

Note:

A full-time student who obtained a FINAL RESULT of between 45% and 49% will be allowed to

write a special 3-hour make-up test covering the whole syllabus during the week after semester examinations end. If the mark obtained is used in place of the major test marks and this results in the student passing, a final result of 50% will be allocated.

SYLLABUS

1. Basic Mathematics
2. Complex Numbers
3. Differentiation I
4. Integration I

MATHEMATICS I (MTHA122 & FMTA121) (Module 2) (160404012) (Serviced subject)

Theory: 1 period per week

Short course Geometry Module for students who have not passed Senior Certificate mathematics Paper Three.

MATHEMATICS II (MATH202) (160404122) (Serviced subject)

Theory: 3 periods per week

Tutorial: 1 periods per week

Continuous Assessment: The best 2 out of 3 class tests and/or assignments will be converted to a mark out of 20. Two control tests will each count 40 (i.e.2 x 40 = 80). A subminimum of 16% (ie 40% of 40%) is required for each of the control tests.

The final result will be the sum of the above out of 100. A final result of 50 or more is required to pass Mathematics II.

Note:

A full-time student who obtained a FINAL RESULT of between 45% and 49% will be allowed to write a special 3-hour make-up test covering the whole syllabus during the week after semester examinations end. If the mark obtained is used in place of the major test marks and this results in the student passing, a final result of 50% will be allocated.

SYLLABUS

1. Differentiation II
2. Integration II
3. First order differential Equations
4. Matrices

PAVEMENT TECHNOLOGY IV MODULE 1 THEORY (PVMT411) (0806114060)

Theory:	4 periods per week	
Semester Mark:	Two tests	- 20% each
Examination:	One 4-hour paper	- 60% (restricted open book)

SYLLABUS

1. Pavement design (Factors, gravel, flexible, rigid)
2. Pavement construction (Gravel, flexible, rigid)
3. Pavement evaluation & rehabilitation
4. Pavement management

PAVEMENT TECHNOLOGY IV MODULE 2 PROJECT (PVMT421) (0806114060)

Project:	1 period per week
Semester Mark:	One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

PRINCIPLES OF MANAGEMENT ECONOMICS III MODULE 1 THEORY (PREM311) (2202006030)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Introduction to micro economics
2. The market
3. Elasticity
4. Market forms
5. A practical macro-economic framework
6. Economic policy

PRINCIPLES OF MANAGEMENT ECONOMICS III MODULE 2 PROJECT (PREM321) (2202006030)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

PROJECT MANAGEMENT IV (CIVIL) MODULE 1 THEORY (PRCV411) (0204027060)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Planning of projects (Civil & Building)
2. Management of projects
3. Quality and time management
4. Management systems
5. Computer applications

PROJECT MANAGEMENT IV (CIVIL) MODULE 2 PROJECT (PRCV421) (0204027060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

REINFORCED CONCRETE AND MASONRY DESIGN III - MODULE 1 (RCMS311)

Theory: 3 periods per week
Tutorial: 1 period per week
Semester Mark: Two tests - 15% each
Design project - 10% (sub-minimum 40% of 10% i.e.4%)
Examination: One 4-hour paper - 60% (restricted open book)

SYLLABUS

1. Reinforced concrete
2. Unreinforced masonry

REINFORCED CONCRETE AND MASONRY DESIGN III - MODULE 2 (RCMS321)

Practical: 1 period per week
Semester Mark: Design project - 70% (subminimum 35%, ie 50% of 70%)
Design Report - 30% (subminimum 15%, ie 50% of 30%)
Examination: No examination

SYLLABUS

The student will be required to be able to demonstrate a suitable standard of competency in selected design software packages and will cover the following aspects:

1. Enter the geometry of a structure
2. Supply supports to the structure ensuring structural stability
3. Assign structural members and the correct orientation thereof
4. Apply all loads (dead, live and wind) including combinations
5. Carry out analysis to determine the load effects on specific elements
6. Design any element according to the relevant code of practice
7. Produce a schedule of reinforcement

RETICULATION DESIGN & MANAGEMENT IV MODULE 1 THEORY (RDMN411) (0806119060)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Hydraulic principles
2. Design parameters
3. Ancillary works
4. Pumping installations
5. System operation
6. Water management
7. Waste management
8. Environmental aspects

RETICULATION DESIGN & MANAGEMENT IV MODULE 2 PROJECT (RDMN421) (0806119060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

SOLID WASTE MANAGEMENT IV MODULE 1 THEORY (SLWM411) (0806120060)

Theory: 4 periods per week
Semester Mark: One test - 20%
Examination: One three-hour paper - 60%

SYLLABUS

1. Characteristics of waste
2. Solid waste disposal methods
3. Design. operation & management of landfill sites

4. Operation & management of solid waste removal systems
5. Third World applications
6. Waste recycling
7. Emergency waste management
8. Legal aspects

SOLID WASTE MANAGEMENT IV MODULE 2 PROJECT (SLWM421) (0806120060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

STRUCTURAL ANALYSIS II - MODULE 1 (STAL211)

Theory: 2 periods per week
Tutorial: 1 period per week
Practical: 1 period per week
Semester Mark: Two tests - 15% each
Project - 10% (library research is required for the project)
Examination: One three-hour paper - 60%

SYLLABUS

1. Analysis of statically determinate structures
2. Axially loaded compression members
3. Combined stress

STRUCTURAL ANALYSIS II - MODULE 2 (STAL221)

Practical: 1 period per week
Semester Mark: Computer competency assignment - 70%
Control Test - 30% (subminimum of 15% ie 50% of 30%)
Examination: No examination

SYLLABUS

The student will be required to be able to demonstrate a suitable standard of competency in selected design software packages and will cover the following aspects:

1. Enter the geometry of a statically determinate beam and three pinned plane frames
2. Enter the members, supports, loads
3. Do an analysis of the structure, draw the deflected shape, bending moment, shear force, and the axial force diagrams.

STRUCTURAL ANALYSIS III - MODULE 1 (STAL311)

Theory: 3 periods per week
Tutorial: 1 period per week
Semester Mark: Two tests - 17% each
Project - 6% (library research is required for the project)
Examination: One three-hour paper - 60%

SYLLABUS

1. Analysis of statically indeterminate structures

STRUCTURAL ANALYSIS III - MODULE 2 (STAL321)

Practical: 1 period per week

Semester Mark:	Two Tests	- 50% each
Examination:	No examination	

SYLLABUS

The student will be required to be able to demonstrate a suitable standard of competency in selected design software packages and will cover the following aspects:

1. Enter the geometry of a statically indeterminate beam and three pinned plane frames
2. Enter the members, supports, loads
3. Do an analysis of the structure, draw the deflected shape, bending moment, shear force, and the axial force diagrams

STRUCTURAL STEEL AND TIMBER DESIGN III - MODULE 1 (SSTM311)

Theory:	3 periods per week	
Tutorial:	1 period per week	
Semester Mark:	Two tests	- 17% each
	Design project	- 6% (sub-minimum 40% of 6% i.e.2.40%)
Examination:	One four-hour paper	- 60% (restricted open book)

SYLLABUS

1. Structural loading
2. Timber design
3. Structural steel design

STRUCTURAL STEEL AND TIMBER DESIGN III - MODULE 2 (SSTM321)

Practical:	1 period per week
Semester Mark:	Two competency control tests- 50% each (subminimum of 50% on each 25%)
Examination:	No examination

SYLLABUS

The student will be required to be able to demonstrate a suitable standard of competency in selected design software packages and will cover the following aspects:

1. Enter the geometry of a plane frame structure
2. Supply supports to the structure ensuring structural stability
3. Assign structural members and the correct orientation thereof
4. Apply all loads (dead, live and wind) including combinations
5. Carry out analysis to determine the load effects on specific elements
6. Design any element according to the relevant code of practice

SURVEYING I - MODULE 1 (SRVY111) (082503912)

Theory:	3 periods per week	
Practical:	2 periods per week	
Semester Mark:	Two tests	- 12% each
	Practical	- 16% (sub-minimum of 8%, ie. 50% of 16% for practical component)
Examination:	One three-hour paper	- 60%

SYLLABUS

1. Basic principles
2. Co-ordinate Calculations
3. Levelling
4. Tacheometry
5. Areas and volumes

SURVEYING I - MODULE 2 (SRVY121)

Practical: 1 period per week
Semester Mark: One instrument competency test (sub-minimum of 70%)
Examination: No examination

SYLLABUS

1. Traversing
2. Levelling
3. Tacheometry

SURVEYING: CIVIL II - MODULE 1 (SRVC211) (082506922)

Theory:	2 periods per week		
Practical:	2 period per week		
Semester Mark:	Two tests		- 15% each
	Practicals	Practical 1	- 12%
		Practical 2	- 12%
		Practical 3	- 6%
			- Total 30% (subminimum of 15%, ie. 50% of 30%, for practical component)
	Control test		- 40% (subminimum of 16%, ie 40% of 40%)
Examination:	No examination		

SYLLABUS

1. Levelling
2. Traversing
3. Tacheometry
4. Setting out civil engineering structures

SURVEYING: CIVIL II - MODULE 2 (SRVC221)

Practical: 1 period per week
Semester Mark: Two instrument competency tests - 50% each (subminimum of 70% on each)
Examination: No examination

SYLLABUS

1. Traversing
2. Levelling
3. Setting out of Civil Works

THEORY OF STRUCTURES II (THRS201) (080609322)

Theory:	3 periods per week	
Tutorial:	2 periods per week	
Practical:	1 period per week	
Semester Mark:	Two tests	- 12% each
	One practical	- 16% (Library research is required for the practical)
Examination:	One three-hour paper	- 60%

Note:

A student who fails the subject but obtains a mark of 60% or more in the practical will be permitted to carry the practical mark for one subsequent re-registration.

SYLLABUS

1. Sectional properties
2. Stress and strain

3. Analysis of statically determinate beams
4. Analysis of statically determinate pin-jointed frames

TRAFFIC ENGINEERING IV MODULE 1 THEORY (TFEN411) (0806126060)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Traffic surveys
2. Traffic characteristics & flow theory
3. Traffic design
4. Traffic management & urban works
5. Traffic safety
6. Statistical methods
7. Parking studies. system & structures
8. TSM, TDM traffic impact studies
9. Traffic control & forms of signing
10. Interchange & intersection capacities

TRAFFIC ENGINEERING IV MODULE 2 PROJECT (TFEN421) (0806126060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

TRANSPORTATION ENGINEERING II - MODULE 1 (TRNE211)

Theory: 3 periods per week
Semester Mark: Two tests - 10% and 20%
One project - 10% (subminimum 50% of 10%, ie. 5%)
Examination: One three-hour paper - 60%

SYLLABUS

1. Transport planning
2. Traffic engineering
3. Geometric design
4. Rail design
5. Earthwork design
6. Design project

TRANSPORTATION ENGINEERING II - MODULE 2 (TRNE221)

Practical: 1 period per week
Semester Mark: Two Competency Assignments- 40% and 60% (subminimum of 50% on each)
Examination: No examination

SYLLABUS

The student will be required to be able to demonstrate a suitable standard of competency in selected design software packages and will cover the following aspects:

1. Preparing a digital terrain model
2. Contouring

3. Horizontal alignment
4. Vertical alignment
5. Access design
6. Mass haul diagram

TRANSPORTATION ENGINEERING III - MODULE 1 (Theory) (TRNE311)

Theory:	2 periods per week	
Semester Mark:	Two tests	- 15% each
	One project	- 10% (subminimum 50% of 10%, ie. 5%)
Examination:	One two-hour paper	- 60% (closed book)

SYLLABUS

1. Pavement design and management
2. Drainage
3. Pavement materials
4. Design project

TRANSPORTATION ENGINEERING III - MODULE 2 (Calculations) (TRNE321)

Theory:	2 periods per week	
Practical:	1 period per week	
Semester Mark:	Two tests	- 15% each
	Lab Practical	- 10% (subminimum 50% of 10%, ie. 5%)
Examination:	One two-hour paper	- 60% (restricted open book)

SYLLABUS

1. Pavement design and management
2. Drainage
3. Pavement materials

TRANSPORTATION ENGINEERING III - MODULE 3 (TRNE331)

Practical:	1 period per week	
Semester Mark:	Three assignments	- 30%, 30% and 40% (subminimum of 50% on each assignment) pass mark requirement –60%
Examination:	No examination	

SYLLABUS

The student will be required to be able to demonstrate a suitable standard of competency in selected design software packages and will cover the following aspects:

1. Stress analysis of pavement layers
2. Development of spreadsheets to perform pavement and materials calculations
3. Economic warrants for the surfacing of roads
4. Economic analysis of short-term rehabilitation actions
5. Basic concepts of rigid pavement design
6. Asphalt mix design
7. Flexible pavement design

TRANSPORTATION PLANNING IV MODULE 1 THEORY (TRNP411) (0806127060)

Theory:	4 periods per week	
Semester Mark:	Two tests	- 20% each
Examination:	One three-hour paper	- 60%

SYLLABUS

1. Planning theory & techniques
2. Transport models
3. Data collection
4. Evaluation
5. Land use planning & characteristics
6. Development control
7. Operation studies
8. Environmental route selection
9. Traffic impact assessment

TRANSPORTATION PLANNING IV MODULE 2 PROJECT (TRNP421) (0806127060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

TRANSPORTATION TECHNOLOGY IV MODULE 1 THEORY (TRNT411) (0806128060)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Transport policies
2. Transportation systems
3. Terminals
4. Public transport
5. Private transport
6. Freight transport
7. Vehicle & driver characteristics

TRANSPORTATION TECHNOLOGY IV MODULE 2 PROJECT (TRNT421) (0806128060

URBAN PLANNING & DESIGN IV MODULE 1 THEORY (UPLD411) (0211012060)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Planning
   - 1.1 Historical perspective
   - 1.2 Modern trends
   - 1.3 Land use
   - 1.4 Legal procedure
   - 1.5 Urban infrastructure management, maintenance & finance
2. Design
   - 2.1 Structure
   - 2.2 Residential layouts
   - 2.3 Informal settlements
   - 2.4 Design project with emphasis on the engineering aspects of urban planning & design

3. Terminals
4. Public transport
5. Private transport
6. Freight transport
7. Vehicle & driver characteristics

URBAN PLANNING & DESIGN IV MODULE 2 PROJECT (UPLD421) (0211012060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

WASTE WATER TREATMENT TECHNOLOGY IV MODULE 1 THEORY (WSTT411) (0806129060)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each
Examination: One three-hour paper - 60%

SYLLABUS

1. Waste water properties
2. Treatment processes
3. Treatment plant design
4. Environmental aspects
5. Plant operation

WASTE WATER TREATMENT TECHNOLOGY IV MODULE 2 PROJECT (WSTT421) (0806129060)

Project: 1 period per week
Semester Mark: One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.

WATER ENGINEERING II - MODULE 1 (Hydraulics) (WTRE211) (080609822)

Theory: 3 periods per week
Practical: 1 period per week
Semester Mark: Two tests - 15% each
Practical - 10%
Examination: One three-hour paper - 60%

SYLLABUS

1. Properties of fluids
2. Hydrostatics
3. Buoyancy
4. Fluids in motion
5. Momentum and fluid flow
6. Basic flow measurement
7. Basic pipeline flow
8. Basic pump design

WATER ENGINEERING II - MODULE 2 (Public Health) (WTRE221) (080609822)

Theory: 3 periods per week
Semester Mark: One test - 20%
One Design Assignment - 20%
(Due to the nature of certain sections of the work the student will be required to do self-study in the library. This will be examined in the tests and examination. This library work will comprise approximately 8% of the final mark)
Examination: One two-hour paper - 60%

SYLLABUS

1. Principles of water treatment
2. Waste water treatment and reclamation
3. Design of basic components for water treatment and reclamation works
4. Basic chemical and bio-chemical reactions

WATER ENGINEERING III - MODULE 1 (Hydrology) (WTRE311)

Theory: 2 periods per week
Semester Mark: Two tests - 15%
Project - 10% (subminimum of 5%, ie. 50% of 10%)
(The project work will require data collection; furthermore, the student will be required to read beyond the instructional programme notes for examinations and tests. These will both require library work which will comprise approximately 5% of the final mark, although this could vary considerably, depending on the nature of the projects, etc.)
Examination: One three-hour paper - 60%

SYLLABUS

1. Hydrology
   - 1.1 Precipitation
   - 1.2 Meteorology
   - 1.3 Evaporation and Transpiration
2. Surface Run-off
   - 2.1 Flow measurement
   - 2.2 Hydrograph analysis
   - 2.3 Flood routing
   - 2.4 Probability
   - 2.5 Flood determination
   - 2.6 Rational method

WATER ENGINEERING III - MODULE 2 (Hydraulics) (WTRE321)

Theory: 2 periods per week
Semester Mark: Two tests - 15%
Project - 10% (subminimum of 5%, ie. 50% of 10%)
(The project work will require data collection; furthermore the student will be required to read beyond the instructional programme notes for examinations and tests)
Examination: One three-hour paper - 60%

SYLLABUS

1. Open channel flow
2. Pumping principles
3. Pipelines and steel pipeline design

4. Basic water supply provision

WATER ENGINEERING III - MODULE 3 (WTRE331)

Practical:	1 period per week	
Semester Mark:	One assignment	- 60%
	One assignment	- 40% (subminimum of 20% - ie 50%)
Examination:	No examination	

SYLLABUS

The student will be required to be able to demonstrate a suitable standard of competency in selected design software packages and will cover the following aspects:

1. Open channel flow
2. Pumping principles
3. Pipelines and steel pipeline design
4. Basic water supply provision
5. Surface run-off
6. Hydrology

WATER TREATMENT TECHNOLOGY IV MODULE 1 THEORY (WTRT411) (0806130060)

Theory:	4 periods per week	
Semester Mark:	Two tests	- 20% each
Examination:	One three-hour paper	- 60%

SYLLABUS

1. Water properties
2. Treatment processes
3. Treatment plant design
4. Water recycling, re-use, recovery & conservation
5. Environmental aspects
6. Plant operation & management

WATER TREATMENT TECHNOLOGY IV MODULE 2 PROJECT (WTRT421) (0806130060)

Project:	1 period per week
Semester Mark:	One industry based project - 100%

SYLLABUS

Students will be required to investigate and produce an appropriate industry related design project.