



 **DUT**
DURBAN
UNIVERSITY OF
TECHNOLOGY

2018 HANDBOOK
CIVIL ENGINEERING AND SURVEYING

 **FACULTY OF**
ENGINEERING
& THE BUILT
ENVIRONMENT

HANDBOOK FOR 2018

FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT

**DEPARTMENT of
CIVIL ENGINEERING
and SURVEYING
(Steve Biko Campus)**

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 AND SURVEYING

To be a quality driven department of Civil Engineering and Surveying 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 Bachelor of Engineering Technology in Civil Engineering BEngTech (Civil) is for students to acquire knowledge, understanding, abilities and skills of civil engineering. This combined with a period of post qualification mentored work experience will enable them to become competent practicing civil engineering technologists, able to apply engineering judgment and work independently and responsibly. To provide students with the preparation required for careers in civil engineering, the ability to make a contribution to the economy and national development, the educational base required for registration with ECSA as a Professional Engineering Technologist in civil engineering and with entry to NQF level 8 programmes, e.g. honours and master's programmes. To contribute to the critical mass of civil engineering technologists educated specifically for the world of work and research, and who also play a pivotal role in the infrastructure development of our country.

The duration of these modules is 3 years of full-time study. The programmes will prepare students for further post graduate studies and research.

The purpose of The National Diploma: Surveying is to train surveyors who are needed for the highly technical skills required for the mapping of the country's assets as well as to provide the infra-structure for the development of the country. Many job opportunities exist in this field and therefore skilled technicians need to be trained continuously. Learners qualifying with this qualification will be able to register as a Survey Technician with the South African Geomatics Council (SAGC). They will be employed in the field of the surveying industry, which includes civil engineering, topographical mapping and GIS. After six years' experience they will be able to register as a Surveyor, *this only applies to students who were registered for the qualification prior to 31 December 2014.*

The purpose of the Bachelor of the Built Environment in Geomatics

BBE (Geomatics) is for students to assimilate the necessary knowledge, understanding, abilities and skills in geomatics. This combined with a period of post qualification mentored work experience will enable them to become competent practicing engineering surveying technologists (engineering surveyors), able to apply geomatics knowledge to make judgment, work independently and responsibly. To provide students, with the preparation required for careers in geomatics, the ability to make a contribution to the economy and national development, the educational base required for registration with the South African Geomatics Council (SAGC) as an engineering surveyor and entry to NQF level 8 programmes, i.e. honours and masters programmes. To contribute to the critical mass of engineering surveyors educated specifically for the world of work and research, and who also play a pivotal role in the infrastructure development of our country. The duration of these modules is 3 years of full-time study. The programmes will prepare students for further post graduate studies and research.

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.

The purpose of the Baccalaureus Technologiae: Surveying is to educate and train competent, responsible and accountable surveyors who can be registered as professional surveyors. They will be qualified to work independently, perform advanced surveying skills and manage a survey practice. The need exists for the training of specialists in the field of engineering surveying to provide for the academic requirements as set out by the South African Council for Professional and Technical Surveyors so that candidates can register as Professional Surveyors and to produce qualified entrepreneurs in the surveying field who can contribute positively to the development of the South African economy.

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.

CONTENTS

	Page
1. CONTACT DETAILS	1
2. STAFFING	2
3. PROGRAMMES OFFERED BY THE DEPARTMENT	4
4. PROGRAMME INFORMATION AND RULES	4
5. PROGRAMME STRUCTURE	15
6. ASSESSMENT RULES	22
7. RE-REGISTRATION RULES	22
8. INDICATIVE CONTENT	23

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.

I. CONTACT DETAILS

All departmental queries to:

Secretary: Ms Pauline Steel
Telephone No: 031 373 2224
Fax No: 031 373 2816
Location of Department: Block S6 Level 3, Steve Biko Campus
(Civil Engineering & Surveying)

All Faculty queries to:

Faculty officer: Mrs Neetha Singh
Telephone No: 031 373 2718
Fax No: 031 373 2719
Location of Faculty office: Block S4 Level 3, Steve Biko Campus

Executive Dean: Prof Theo Andrew

Telephone No: 031 373 2762
Fax No: 031 373 2668
Location of Executive Dean's office: Block S6 Level 5, Steve Biko Campus

2. STAFFING

Head of Department	Mr G M Hoosen, M.Dip.Tech. (CE) (MLST)
Associate Director	Prof D Allopi, Pr.Tech. (Eng); D.Tech (CE) (MLST); M.Dip.Tech (CE) (TN); Postgrad. Dip. Eng. GDE (UN); Dip Datametrics (cum Laude) (Unisa); FSAICE; MIPET; MSAT; MCITSA. Mr G K Parrott, PR.Tech (Eng); M.DIP. Tech (CE) (TN); FSAICE
Senior Lecturers	Mr R Govender, M.Dip.Tech (CE) (MLST) Mr Y S Vahed, M.Dip.Tech (MLST); NHD Post School Education (MLST) Mr Y M Vawda, Pr.Tech. (Eng); M.Dip.Tech. (CE) (MLST); Bsc (Hons) (UP); MSC (APP SC) STRUCTURAL
Lecturers	Mr K Han, B.E.(Civil); M.Sc.Eng. (PHECE) Mr S Hariparsad, MEng (DUT); B.Sc. (Eng) (UDW); Mr S Jairam, B.Tech (CE) (TN) Mr HA Jajbhay Pr.Techni. (Eng); BSc Hons (App Sc. - Structures) (UP); B.Tech (DUT) Mr R Kasaven, Pr.Tech.(Eng); M.Dip Tech Mr B Khuzwayo, MEng (DUT); B.Tech Mr M Phiri, MSc.Eng *Mr A Raghubar, B.Tech (Sur) (DUT); N.Dip (Sur) (NT); AMSAGI. ST (SA) Mr B J Saane, B.Tech (Sur) (MLST); M.EnvDev; AMSAGI, ST (SA) Mr C Singh, MSc (GISc)(Manchester); Med (UDW); Pr GISc (SA); Pr S(SA); Dip Data (UNISA); B.Tech (Man) (MLST); ACE (Maths) (UNISA); PGD (NMMU) Ms S Vahed, Pr.Tech.(Eng); M.Tech. (CE) (MLST) Ms X Feikie B.Tech (CUT) (CE)
nGap Lecturer	
Senior Technician	Mr K M Paul, MSAT
Technicians	Mr W Kinghorn, N.Dip (Sur) (TN) Mr S Ramparsad N.Dip (Sur) (TN) Mr A S Sewpal, MSAT

*Survey Programme Co-Ordinator

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 (currently being phased out)
Bachelor of Engineering Technology in Civil Engineering	98956
National Diploma: Surveying	72264 (currently being phased out)
Bachelor of the Built Environment in Geomatics	101432
B. Tech: Engineering: Civil	72128
B. Tech: Surveying	72161
Master of Engineering	96827
Master of the Built Environment	96844
Doctor of Engineering	96812
Doctor of Philosophy in the Built Environment	96821

Please note that due to National legislation, signed into effect by the Minister of Higher Education in the Government Gazette no. 40123 of 6th July 2016, the last permitted enrolment for any non-HEQSF aligned programme will be the 31st December 2019. This means that you will not be able to enrol in a Bachelor of Technology (B Tech) degree at DUT, or at any other institution in South Africa after this date.

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 a three-year programme of study.

4.1 PHASE OUT RULES FOR THE NATIONAL DIPLOMA: ENGINEERING: CIVIL

Important information for current and prospective students (effective as of January 2016):

The current National Diploma: Engineering: Civil will be phased out starting in 2016 to allow for the introduction of the new Bachelor of Engineering Technology in Civil Engineering.

The last cohort of first-time entering students admitted to this National Diploma qualification will be in January 2016.

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 modules is listed as follows:

Module Name	Last Possible Semester of Registration
Applied Mechanics I	July 2016
Computer Skills I	July 2016
Construction Materials I	July 2016
Drawing I	July 2016
Mathematics I	July 2016
Surveying I (Module 1)	July 2016
Surveying I (Module 2)	July 2016
Communication Skills I	July 2017
Construction Methods I	July 2017
Drawing II	July 2017
Management Civil I	July 2017
Surveying (Civil) II (M1)	July 2017
Surveying (Civil) II (M2)	July 2017
Mathematics II	July 2017
Geotechnical Engineering II	July 2018
Management (Civil) II (M1)	July 2018
Management (Civil) II (M2)	July 2018
Structural Analysis II (M1)	July 2018
Structural Analysis II (M2)	July 2018
Structural Steel & Timber Design III (M1)	July 2018
Structural Steel & Timber Design III (M2)	July 2018
Transportation Engineering II (M1)	July 2018
Transportation Engineering II (M2)	July 2018
Water Engineering II (Hydraulics) (M1)	July 2018
Water Engineering II (Public Health) M2)	July 2018
Documentation III (M1)	July 2019
Documentation III (M2)	July 2019
Geotechnical Engineering III (M1)	July 2019
Geotechnical Engineering III (M2)	July 2019
Reinforced Concrete & Masonry Design III (M1)	July 2019
Reinforced Concrete & Masonry Design III (M2)	July 2019
Structural Analysis III (M1)	July 2019
Structural Analysis III (M2)	July 2019
Transportation Engineering III (M1)	July 2019
Transportation Engineering III (M2)	July 2019
Transportation Engineering III (M3)	July 2019
Water Engineering III (Hydrology) (M1)	July 2019
Water Engineering III (Hydraulics) (M2)	July 2019
Water Engineering III (M3)	July 2019
Experiential Learning (P2)	January 2020
Experiential Learning (P3)	July 2020

No student may register for Experiential Learning (P2) or Experiential Learning (P3) unless they have completed the following prerequisites.

Experiential Learning (P2)

Pre-requisites: Complete ALL Diploma modules BEFORE commencing Experiential Learning (P2)

Experiential Learning (P3)

Pre-requisites: Complete Experiential Learning (P2)

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

4.2 PHASE OUT RULES FOR THE NATIONAL DIPLOMA: SURVEYING

Important information for current and prospective students (effective as of January 2017):

The current National Diploma: Surveying will be phased out starting in 2017 to allow for the introduction of the new Bachelor of the Built Environment in Geomatics.

The last cohort of first-time entering students admitted to this National Diploma qualification will be in 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 modules is listed as follows:

Module Name	Last Possible Semester of Registration
Computer Skills I	July 2017
Drawing I	July 2017
Geography I	July 2017
Mathematics I	July 2017
Physics I	July 2017
Surveying I (Module 1)	July 2017
Surveying I (Module 2)	July 2017
Communication Skills I	July 2018
Civil Engineering I	July 2018
Mathematics II	July 2018
Photogrammetry II	July 2018
Surveying II (M1)	July 2018
Surveying II (M2)	July 2018
Survey Drawing II (M1)	July 2018
Survey Drawing II (M2)	July 2018
Management Civil I	July 2019
Control Surveying III	July 2019
Legal Principles I	July 2019
Statistics I	July 2019
Photogrammetry III	July 2019
Adjustment of Errors III	July 2020
Cadastral Surveying III	July 2020
Computer Applications III	July 2020
Geographic Information Systems III	July 2020
Surveying III	July 2020
Experiential Learning (P2)	January 2021

No student may register for Experiential Learning (P2) unless they have completed the following prerequisites.

Complete ALL Diploma modules BEFORE commencing Experiential Learning (P2)

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

MINIMUM ADMISSION REQUIREMENTS

BACHELOR OF ENGINEERING TECHNOLOGY IN CIVIL ENGINEERING – BEngTech (Civil)

BACHELOR OF THE BUILT ENVIRONMENT IN GEOMATICS BBE (Geomatics)

In addition to the relevant General Rules pertaining to Registration (e.g. Rules G3, G4, G5, G6, G7, G8, G9 & G10).

School leaving applicants who wish to enrol for the programme must apply through the CAO system by no later than 30 September of the previous year. The number of students enrolled in the program is determined by the University and departmental growth policies and a ranking system is used to determine the number of applicants as required.

The minimum admission requirement is the National Senior Certificate, Senior Certificate or the National Certificate (Vocational) with appropriate module combinations and levels of achievement as defined in the *Government Gazette*, Vol. 751, No. 32131 of 11 July 2008, and in the *Government Gazette*, Vol. 533, No. 32743, November 2009.

In addition to the above, the following is required for admission

Compulsory Modules	NSC	SC		NCV Level 4
	Rating	HG	SG	
English	4	E	C	60%
Mathematics	4	E	C	70%
Physical Science	4	E	C	70%
Life Orientation				60%
				+ 2 vocational subs (70%)

The module NSC Mathematical Literacy will not be accepted as a substitute for the module NSC Mathematics.

The exit certificate of the applicant must qualify the applicant for degree study at an institution of higher learning.

Applicants with a NSC will be ranked according to the sum of their scores for Mathematics and Physical Science, module to a minimum combined score of 120.

Prospective applicants may also present an NQF level 6 Diploma in Engineering for entry into the degree programme. A possibility of transfer of credits for cognitive previous studies would be considered dependant on the discipline nature of the Diploma being presented.

Note: This Department only considers First and Second choice for BEng Tech (Civil) and First – Fourth choice for BBE (Geomatics) 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 conferment 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 modules 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

BACCALAUREUS TECHNOLOGIAE: SURVEYING

Every candidate for this qualification shall have:

1. completed the requirements for the National Diploma: Surveying or the National Higher Diploma: Surveying or have been granted conferment of status of one of these qualifications
and
2. completed a minimum of one year of post diploma experience in the field of surveying or an appropriate aligned field.

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 modules:

1. The determination of the year/semester mark, where applicable, for each module for the purpose of issuing a certificate in terms of the General Rules is indicated with the syllabus for each module.
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 module 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 module, will have to repeat that module.
4. Where a module 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 module is failed, unless the project is a separate registered module.

EC6 CONDUCT OF STUDENTS IN LABORATORY

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

EC7 SUPPLEMENTARY EXAMINATIONS

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

EC8.1 PROMOTION TO HIGHER LEVEL (NATIONAL DIPLOMAS)

For each of the programmes in this department standard module combinations for the semesters of University attendance (semesters 1, 2, 3 and 4) 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 module (i.e. S2) when more than **three** modules from the standard first semester module combination are outstanding;
- (b) for any module of the standard third semester module combination (i.e. S3) when more than **three** modules from the standard first and second semester module combination (ie S1 & S2) are outstanding.
- (c) for any module of the standard fourth semester module combination (i.e. S4) when more than **three** modules from the standard first, second and third semester module combination (i.e. S1, S2 & S3) are outstanding.
- (d) furthermore, students who are repeating a module will only be offered a place module 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

modules from the first semester level (ie the standard S1). A student who applies for admission through the CAO, and who has completed equivalent modules through another tertiary institution will only be granted an exemption if prior disclosure of these modules has been made and confirmation thereof has been given in writing by the departmental HOD.

EC8.2 PROMOTION TO A HIGHER LEVEL / PROGRESSION RULES BEngTech (Civil) and BBE (Geomatics)

Engineering students completing this qualification shall demonstrate competence in all the following Exit Level Outcomes (ELO) indicated below, as required by the Accrediting body – the Engineering Council of South Africa (ECSA) / South African Geomatics Council (SAGC). Assessment of these ELO's are embedded in the modules of the degree. In modules where Exit Level Outcomes (ELO) are assessed, the student must meet both the academic and the ELO requirements, as specified in the relevant study guide, to pass the module.

In modules where Graduate Attributes are assessed, the student needs to achieve a minimum final mark of 50% as well as satisfy the Graduate Attributes outcome. A student that achieves a minimum final mark of 50% but fails to achieve the outcome would fail the module. In addition, students must achieve sub-minimum marks for practicals, tests or other assessments.

Exit Level Outcome 1: Problem Solving

Students will be required to apply engineering principles to systematically diagnose and solve broadly-defined engineering problems in modules at all levels.

Exit Level Outcome 2: Application of scientific and engineering knowledge

Students will be required to apply knowledge of mathematics, natural science, and engineering sciences to define and applied engineering procedures, processes, systems and methodologies to solve broadly-defined engineering problems.

Exit Level Outcome 3: Engineering Design

Students will be required to perform design tasks in Projects at all levels. Work will be more of a procedural nature at the first level, and will increase in complexity through the levels. In Design Projects A & B, the preliminary part of the design will be carried out in part A, while part B will see to the project completion. The project will include one or more of the following impacts: social, economic, legal, health, safety, and environmental. Design Projects A & B are to be seen collectively as one large project.

Exit Level Outcome 4: Investigation

Students will conduct investigations of broadly-defined problems through locating, searching, and selecting relevant data from codes, data bases, and literature, designing and conducting experiments, analysing and interpreting results to provide valid conclusions.

Exit Level Outcome 5: Engineering methods, skills, tools, including Information technology. Use of appropriate techniques, resources, and modern engineering tools,

including information technology, prediction and modelling, for the solution of broadly-defined engineering problems, with an understanding of the limitations, restrictions, premises, assumptions and constraints will be embedded in all modules.

Exit Level Outcome 6: Professional and Technical Communication

Students will be required to demonstrate the ability to communicate effectively, by submitting research assignments and deliver oral presentations, with engineering audiences and the affected parties.

Exit Level Outcome 7: Impact of Engineering Activity

Demonstrate knowledge and understanding of the impact of engineering activity will be embedded in many courses as well as specifically in the module of Environmental Engineering.

Exit Level Outcome 8: Individual and Teamwork

Knowledge and understanding of engineering management principles will be specifically covered in the Module of Entrepreneurship Skills. Individual and teamwork competency will be addressed in other modules as well. The ability to manage a project will be demonstrated in the module Design Projects A & B.

Exit Level Outcome 9: Independent Learning

Engage in independent and life-long learning through well-developed learning skills.

Exit Level Outcome 10: Engineering Professionalism

Students will be assessed on their comprehension and application of ethical principles and commitment to professional ethics, responsibilities, and norms of engineering technology practice.

- In addition to the requirements of the General Rules no student shall be permitted to register:
- for any second year modules when more than six modules from the first year module combination are outstanding;
- for any third year modules when more than twelve modules from the first and second year module combination are outstanding.
- for any third year modules (2nd semester) when any first, second and third year (1st semester) module combinations are outstanding.

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 the 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 Durban 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 module as specified in the study guide for the particular module.

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 module, and shall include tests set for modules 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 modules shall be written within the last two weeks of official lectures of each semester and may be based on the entire semesters work.

ECII REFUSAL OF RE-REGISTRATION

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

11.2 A student who has been refused permission to re-register for a module in terms of Rule 11.1 will not be permitted to register for any other module in that qualification. A student will thereby be unable to complete the qualification unless the outstanding modules are attended and passed at another institution, approved by the Department, and exemptions granted in accordance with the General Rules.

11.3 A student who has not completed the National Diploma within five years of the first registration, may, at the discretion of the Departmental Appeal Committee, be refused permission to re-register, or may be accepted module to special conditions.

11.4 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.

11.5 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 complied with.

11.6 **EXCLUSION DUE TO LACK OF PROGRESS (applicable to BEng Tech (Civil) and BBE (Geomatics)) (UNSATISFACTORY ACADEMIC PROGRESS)**

Further to Rule G17, a student will be excluded if the student fails to:

- Pass all first year modules by the end of their second year of registration;
- Pass all second year modules by the end of their third year of registration;
- Pass at least half of the third year modules by the end of their fourth year of registration;
- Complete the qualification by the end of five years of registration.

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 modules (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 module of Experiential Learning until he/she has satisfied all the requirements for the first 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 1 and 2.

EC13 LATE REGISTRATION

13.1 No student will be permitted to register for any module offered by this department later than one week after the official commencement of full-time semester lectures.

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

EC14 TIMETABLE CLASHES

No student will be permitted to register for any module 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 module 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.

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.

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 module lecturer or an approved departmental tutor is present;

or

16.2 the Departmental Computer Technician is present;

or

16.3 the necessary authentication has been done to your active student card by the departmental technician. Your activated card may not be used by any student other than the student to whom the card belongs. Should an activated student card be found in the possession of anyone other than the authorised user then such student card shall be confiscated and invalidated.

EC17 COMPETENCY MODULES

Where a module 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 module for which the modularized module 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 modules listed below.

Code	Modules	C/O	Semester	Assessment Method	NQF Level	Pre-requisite
GTEN201	Geotechnical Engineering II	C	Third	3 hr exam	6	CSMT101 or CMET101
MCIV211#	Management: Civil II (Module 1)	C	Third	3 hr exam	6	MCIV102
MCIV221	Management: Civil II (Module 2)	C	Third	Control Test	6	MCIV102
SANA211#	Structural Analysis II (Module 1)	C	Third	3 hr exam	6	TSTR202
SANA221	Structural Analysis II (Module 2)	C	Third	Control Test	6	TSTR202
STTD311#	Structural Steel & Timber Design III (Module 1)	C	Third	4 hr exam restricted open book	6	TSTR20
STTD321	Structural Steel & Timber Design III (Module 2)	C	Third	Control Test	6	TSTR202
TPEN211#	Transportation Engineering II (Module 1)	C	Third	3 hr exam	6	DRNG201
TPEN221	Transportation Engineering II (Module 2)	C	Third	Control Test	6	DRNG201
WENG213	Water Engineering II (Module 1 - Hydraulics)	C	Third	3 hr exam	6	MATH201 TSTR202
WENG223	Water Engineering II (Module 2 - Public Health)	C	Third	2 hr exam	6	MATH201 TSTR202
DOCU311#	Documentation III (Module 1)	C	Fourth	4 hr exam restricted open book	6	MCIV201
DOCU321	Documentation III (Module 2)	C	Fourth	Control Test	6	MCIV201
GTEN311#	Geotechnical Eng. III (Module 1)	C	Fourth	3 hr exam	6	GTEN201
GTEN321	Geotechnical Eng. III (Module 2)	C	Fourth	Control Test	6	GTEN201
RCMD311#	Reinforced Concrete & Masonry Design III (Module 1)	C	Fourth	4 hr exam restricted open book	6	SANA201
RCMD321	Reinforced Concrete & Masonry Design III (Module 2)	C	Fourth	Control Test	6	SANA201
SANA311#	Structural Analysis III (Module 1)	C	Fourth	3 hr exam	6	SANA201
SANA321	Structural Analysis III (Module 2)	C	Fourth	Control Test	6	SANA201
TPEN311#	Transportation Engineering III (Module 1 - Theory)	C	Fourth	2 hr exam	6	TPEN201
TPEN321	Transportation Engineering III (Module 2 - Calcs)	C	Fourth	2 hr exam restricted open book	6	TPEN201
TPEN331	Transportation Engineering III (Module 3)	C	Fourth	Control Test	6	TPEN201
WENG313#	Water Engineering III (Module 1 - Hydrology)	C	Fourth	3 hr exam	6	WENG203
WENG323	Water Engineering III (Module 2 - Hydraulics)	C	Fourth	3 hr exam	6	WENG203
WENG333	Water Engineering III (Module 3)	C	Fourth	Control Test	6	WENG203
EXCV201	Engineering Practice II (Module 1)	C	Fifth & Sixth			
EXCV301	Engineering Practice II (Module 2)	C	Fifth & Sixth			

5.2 BACHELOR OF ENGINEERING TECHNOLOGY IN CIVIL ENGINEERING.

All modules in the programme are compulsory, offered on a full time basis and require attendance to lectures. There are no electives given for the programme.

Name of module	Study Level	NQF Level	Module Credits	C/E*	Pre-Requisite Modules
Year 1 Semester 1					
Engineering Mathematics 1A	1	5	12	C	
Engineering Physics 1A	1	5	12	C	
Law for Life	1	5	8	C	
Cornerstone 101	1	5	12	C	
Civil Mechanics 1A	1	5	8	C	
Drawings 1A (intro to CAD basic incl)	1	5	12	C	
Year 1 Semester 2					
Engineering Mathematics 1B	1	5	12	C	
Engineering Physics 1B	1	5	12	C	
Surveying for Civil engineering 1B	1	5	16	C	
Civil Engineering Methods 1B	1	5	12	C	
Structural Mechanics 1B	1	5	12	C	
Technical Literacy	1	5	8	C	
Year 2 Semester 1					
Engineering Mathematics 2A	2	6	12	C	Engineering Mathematics 1A and Engineering Mathematics 1B
Engineering Management 2A	2	6	8	C	
Structural Mechanics 2A	2	6	12	C	Civil Mechanics 1A and Structural Mechanics 1B
Water/Hydraulics 2A	2	6	12	C	Civil Mechanics 1A, Engineering Mathematics 1A and Engineering Mathematics 1B
Civil Eng Material 2A	2	6	12	C	
Transport Technology 2A	2	6	12	C	
Year 2 Semester 2					
Engineering Mathematics 2B	2	6	12	C	Engineering Mathematics 2A
Structural Design Theory Intro 2B	2	6	16	C	Structural Mechanics 2A
Structural Analysis 2B	2	6	12	C	Structural Mechanics 2A
Water/Hydrology2B	2	6	12	C	Civil Mechanics 1A, Engineering Mathematics 1A and Engineering Mathematics 1B
Geotechnical Engineering 2B	2	6	12	C	
Transport Technology 2B	2	6	12	C	
Year 3 Semester 1					
CAD Civil Engineering Drawings3A	3	7	12	C	Drawings 1A
Reinforced Concrete Design 3A	3	7	12	C	Structural Design Theory Intro 2B and Structural Analysis 2B
Water/ Reticulation Design 3A	3	7	12	C	Water/Hydraulics 2A, Water/Hydrology2B, Engineering Mathematics 2A and Engineering Mathematics 2B
Transport Technology 3A	3	7	16	C	Transport Technology 2A
Construction Management 3A	3	7	12	C	Engineering Management 2A
Civil Engineering Documentation 3A	3	7	12	C	Civil Eng Material 2A, Engineering Management 2A
Year 3 Semester 2					
Design Project	3	7	20	C	All 1 st and 2 nd year modules + all 3 rd year 1 st sem modules
Structural Steel Design 3B	3	7	12	C	Structural Design Theory Intro 2B and Structural Analysis 2B
Project Management	3	7	8	C	
Transport Technology 3B	3	7	12	C	
Water Treatment Technology 3B	3	7	12	C	

5.3 NATIONAL DIPLOMA: SURVEYING

Code	Modules	C/O	Semester	Assessment Method	NQF Level	Pre-requisite
CSKI103	Communication Skills I	C	Second	Continual	6	
CVLE101	Civil Engineering I	C	Second	3 hr exam	6	
MATH201	Mathematics II	C	Second	Continual	6	MATH101
PHTG202	Photogrammetry II	C	Second	3 hr exam	6	SURV112
SURV212#	Surveying II (Module 1)	C	Second	3 hr exam	6	SURV112
SURV222	Surveying II (Module 2)	C	Second	Continual	6	SURV112
SDRG212#	Survey Drawing II (Module 1)	C	Second	Continual	5	DRWG102
SDRG222	Survey Drawing II (Module 2)	C	Second	Continual	5	DRWG102 CSKL102
MCIV102	Management: Civil I	C	Third	3 hr exam	6	
EXSV201	Survey Practice II	C	Fifth			SURV112
CSRV301	Control Surveying III	C	Third	3 hr exam	6	SURV212 and EXSV201
GTEN201	Geotechnical Engineering II**	C	Third	3 hr exam	6	
LPRN101	Legal Principles I	C	Third	3 hr exam	6	
STAS103	Statistics I	C	Third	3 hr exam	6	
PHTG302	Photogrammetry III	C	Third	3 hr exam	6	PHTG202 and EXSV201
AERR301	Adjustment of Errors III	C	Fourth	3 hr exam	6	MATH201 and STAS103 and EXSV201
CSUR301	Cadastral Surveying III	C	Fourth	3 hr exam	6	SDRG202 and EXSV201
CAPP302	Computer Applications III	C	Fourth	Continual	6	CSKL102, EXSV201 MATH201 and STA103
GEIS301	Geographical Information	C	Fourth	Continual	6	GEGRI01, Systems III EXSV201 CSKL102 and SURV112
SURV302	Surveying III	C	Fourth	3 hr exam	6	SURV212, EXSV201 and SDRG212

C = Compulsory; O = Optional

Denotes that the module is modularised and comprises one or more theoretical and a proficiency module, in which case the proficiency module must also be passed to register for any module for which the modularized module 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 fifth and sixth semesters. However, all students must attend at least one academic semester before registering for Module One of Civil Engineering Practice.

* Survey 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 and pass Surveying I (SURV102) before commencing a semester of Surveying Practice II. Furthermore a student may not register for any modules in the fifth or sixth semester unless at least six months of experiential learning has been completed.

** Denotes that the module may be taken as an alternative elective to Civil Engineering I

\$ Computer Applications III may only be taken if registered concurrently for Adjustment of Errors III, or if Adjustment of Errors III has already been passed.

5.4 BACHELOR OF THE BUILT ENVIRONMENT IN GEOMATICS

All modules in the programme are compulsory, offered on a full time basis and require attendance to lectures. There are no electives given for the programme.

Name of module	Study Level	NQF Level	NQF Credits	C/E*	Pre-requisite module/s
Year 1 Semester 1					
Engineering Mathematics IA	1	5	12	C	
Cornerstone 101	1	5	12	C	
Sociology of Work 101	1	6	8	C	
Geomatics IA	1	5	16	C	
Drawing IA	1	5	12	C	
Engineering Physics IA	1	5	12	C	
Year 1 Semester 2					
Engineering Mathematics IB	1	5	12	C	
Geomatics IB	1	6	16	C	Geomatics IA
Survey Drawing IB	1	5	12	C	Drawing IA, Geomatics IA
Environmental Science IB	1	5	12	C	
Technical Literacy	1	5	8	C	
Engineering Physics IB	1	5	12	C	
Year 2 Semester 1					
Engineering Mathematics 2A	2	6	12	C	Engineering Mathematics IB
Photogrammetry 2A	2	6	12	C	Geomatics IB
Settlement History 101	2	6	8	C	
Basic Engineering Management 2A	2	6	8	C	
Control Surveying 2A	2	6	20	C	Geomatics IB
Geographic Information System 2A	2	6	12	C	Environmental Science IB
Year 2 Semester 2					
Legal Principles 2B	2	6	12	C	
Engineering Surveying 2B	2	7	24	C	Geomatics IB
Map projections and Coordinate Systems 2B	2	6	12	C	Geomatics IB
Digital Photogrammetry and Remote Sensing 2B	2	7	12	C	Photogrammetry 2A
Statistics 2B	2	6	12	C	Engineering Mathematics IB
Year 3 Semester 1					
Geodesy 3A	3	7	16	C	Map Projections and Coordinate Systems 2B, Engineering Mathematics 2A
Cadastral Surveying 3A	3	7	12	C	Geomatics IB, Survey Drawing IB
Theory of Errors and Network Adjustment 3A	3	7	20	C	Statistics 2B
Geographic Information System 3A	3	7	12	C	Geographic Information Systems 2B
Computer Applications 3A	3	7	12	C	Survey Drawing IB
Town and Regional Planning: Layout & Design 3A	3	6	12	C	Settlement History 101
Year 3 Semester 2					
Project Management	3	7	8	C	Basic Engineering Management 2A
The Global Environment	3	6	8	C	Environmental Science IB
Survey Project 3B	3	7	32	C	All 1 st and 2 nd year modules and all 3 rd year 1 st semester modules

5.5 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL

This instructional programme has a minimum duration of four (4) semesters when undertaken on a part-time or block basis and may be offered in five specialist options listed below:

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

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 modules from any of the other specialist disciplines. Project Management (Civil) IV is a compulsory module for this option.

Code	Modules	C/O	Assessment Method	NQF Level
CNTM411	Contract Management: Civil IV (Module 1 - Theory)	C	3 hr exam - restricted open book	7
CNTM421	Contract Management: Civil IV (Module 2 - Project)	C	100% year mark	7
IRNG211	Industrial Relations & Negotiation II (Module 1 - Theory)	C	3 hr exam - restricted open book	7
IRNG221	Industrial Relations & Negotiation II (Module 2 - Project)	C	100% year mark	7
MTPP411	Management Principles & Practice IV (Module 1 - Theory)	C	3 hr exam	7
MTPP421	Management Principles & Practice IV (Module 2 - Project)	C	100% year mark	7
PMCV311	Principles of Management Economics III (Module 1 - Theory)	C	3 hr exam	7
PMCV321	Principles of Management Economics III (Module 2 - Project)	C	100% year mark	7
PRJM412	Project Management: Civil IV (Module 1 - Theory)	C	3 hr exam	7
PRJM422	Project Management: Civil IV (Module 2 - Project)	C	100% year mark	7

Plus any three electives from the other specialist disciplines.

Structural Discipline

FNDE411	Foundation Engineering IV (Module 1 - Theory)	C	3 hr exam	7
FNDE421	Foundation Engineering IV (Module 2 - Project)	C	100% year mark	7
RCDE412	Reinforced Concrete Design IV (Module 1 - Theory)	C	4 hr exam - restricted open book	7
RCDE422	Reinforced Concrete Design IV (Module 2 - Project)	C	100% year mark	7
PCDS411	Pre-stressed Concrete Design IV (Module 1 - Theory)	C	4 hr exam - restricted open book	7
PCDS421	Pre-stressed Concrete Design IV (Module 2 - Project)	C	100% year mark	7
SANA411	Structural Analysis IV (Module 1 - Theory)	C	3 hr exam	7
SANA421	Structural Analysis IV (Module 2 Project)	C	100% year mark	7
SMDE411	Structural Masonry Design IV (Module 1 - Theory)	C	4 hr exam - restricted open book	7
SMDE421	Structural Masonry Design IV (Module 2 - Project)	C	100% year mark	7
SSDE411	Structural Steel Design IV (Module 1 - Theory)	C	4 hr exam - restricted open book	7
SSDE421	Structural Steel Design IV (Module 2 - Project)	C	100% year mark	7
STDE411	Structural Timber Design IV (Module 1 - Theory)	C	4 hr exam - restricted open book	7
STDE421	Structural Timber Design IV (Module 2 - Project)	C	100% year mark	7
TSTR412	Theory of Structures IV (Module 1 - Theory)	C	3 hr exam	7
TSTR422	Theory of Structures IV (Module 2 - Project)	C	100% year mark	7

Transportation Discipline

GMDS411	Geometric Design IV (Module 1 Theory)	C	4 hr exam - restricted open book	7
GMDS421	Geometric Design IV (Module 2 Project)	C	100% year mark	7
PVTC411	Pavement Technology IV (Module 1 Theory)	C	3 hr exam	7
PVTC421	Pavement Technology IV (Module 2 Project)	C	100% year mark	7
TENG411	Traffic Engineering IV (Module 1 Theory)	C	3 hr exam	7
TENG421	Traffic Engineering IV (Module 2 Project)	C	100% year mark	7
TPLN411	Transport Planning IV (Module 1 Theory)	C	3 hr exam	7
TPLN421	Transport Planning IV (Module 2 Project)	C	100% year mark	7
TPTE411	Transportation Technology IV (Module 1 Theory)	C	3 hr exam	7
TPTE421	Transportation Technology IV (Module 2 Project)	C	100% year mark	7

Plus any three electives from the other specialist disciplines.

Urban Engineering Discipline

Code	Modules	C/O	Assessment Method	NQF Level
CMTT411	Construction Materials Technology IV (Module 1 Theory)	C	3 hr exam	7
CMTT421	Construction Materials Technology IV (Module 2 Project)	C	100% year mark	7
GMDS411	Geometric Design IV (Module 1 Theory)	C	4 hr exam - restricted open book	7
GMDS421	Geometric Design IV (Module 2 Project)	C	100% year mark	7
PVTC411	Pavement Technology IV (Module 1 Theory)	C	4 hr exam - open book	7
PVTC421	Pavement Technology IV (Module 2 Project)	C	100% year mark	7
RDMT411	Reticulation Design & Management IV (Module 1 Theory)	C	3 hr exam	7
RDMT421	Reticulation Design & Management IV (Module 2 Project)	C	100% year mark	7
SWMT411	Solid Waste Management IV (Module 1 Theory)	C	3 hr exam	7
SWMT421	Solid Waste Management IV (Module 2 Project)	C	100% year mark	7
UPDS411	Urban Planning & Design IV (Module 1 Theory)	C	3 hr exam	7
UPDS421	Urban Planning & Design IV (Module 2 Project)	C	100% year mark	7

Plus any two electives from the other specialist disciplines

Water Discipline

HYDR412	Hydraulics IV (Module 1 Theory)	C	3 hr exam	7
HYDR422	Hydraulics IV (Module 2 Project)	C	100% year mark	7
HLGY411	Hydrology IV (Module 1 Theory)	C	3 hr exam	7
HLGY421	Hydrology IV (Module 2 Project)	C	100% year mark	7
RDMT411	Reticulation Design & Management IV (Module 1 Theory)	C	3 hr exam	7
RDMT421	Reticulation Design & Management IV (Module 2 Project)	C	100% year mark	7
WWTT412	Waste Water Treatment Technology IV (Module 1 Theory)	C	3 hr exam	7
WWTT422	Waste Water Treatment Technology IV (Module 2 Project)	C	100% year mark	7
WTTC411	Water Treatment Technology IV (Module 1 Theory)	C	3 hr exam	7
WTTC421	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** modules must be selected from those listed above, such that at least **five** modules are selected from the chosen specialist option, and such that a minimum of **four** modules 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 modules within those options will necessarily be available at any particular time.

5.6 BACCALAUREUS TECHNOLOGIAE: SURVEYING

This instructional programme has a minimum duration of four (4) semesters when undertaken on a part-time basis as per the criteria below:-

Code	Modules	C/O	Assessment Method	NQF Level
GEOD402	Geodesy IV	C	Continual	7
GISY402	Geographic Information Systems IV	C	Continual	7
PRMT401	Practice Management IV	C	3 hr exam - open book	7
SVPR401	Survey Project IV	C	Continual	7
SURV403	Surveying IV	C	3 hr exam	7
DPHT401	Digital Photogrammetry IV	O	3 hr exam	7
DOCU301	Documentation III	O	3 hr exam	6
FIMG101	Financial Management I	O	3 hr exam	6
GMDS401	Geometric Design IV	O	4 hr exam - open book	7
PHTG401	Photogrammetry IV	O	3 hr exam	7
RSMT101	Research Methodology I	O	Continual	6
TNPL401	Town Planning IV	O	3 hr exam	7

Note:

- In addition to the compulsory modules candidates must select a minimum of three additional modules representing a minimum total NATED credit rating of 0,291 from the list of optional modules and/or from modules of the Engineering, Cartography or Town Planning B.Tech.programmes. (Refer to the relevant departments for these module credit ratings.)
- No more than two modules may be selected from the Engineering, Cartography or Town Planning programmes and these may not represent a total NATED credit rating exceeding 0,200. (Refer to the relevant departments for these module credit ratings.)
- Experiential learning related practical modules may not be included in the modules chosen from the abovementioned programmes.
- Not all of the modules listed for this programme will necessarily be available at any particular time.

**C = Compulsory; O = Optional

5.7 MASTER OF ENGINEERING ENTRANCE REQUIREMENTS

Every candidate for this qualification shall have:

- completed the requirements for the BEngTechHons (Civil Eng) or equivalent
- or**
- 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 module/s related to the specific field of study. Students are required to undertake research under the guidance of a supervisor.

(Amended wef 2015/08)

5.8 MASTER OF THE BUILT ENVIRONMENT ENTRANCE REQUIREMENTS

Every candidate for this qualification shall have:

- completed the requirements for the BBEHons (Geomatics) or equivalent
- or**
- 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 module/s related to the specific field of study. Students are required to undertake research under the guidance of a supervisor.

(Amended wef 2015/08)

5.9 DOCTOR OF ENGINEERING ENTRANCE REQUIREMENTS

Every candidate for this qualification shall have:

1. completed the requirements for the Master of Engineering;

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 module/s related to the specific field of study. Students are required to undertake research under the guidance of a supervisor.

(Amended wef 2015/08)

5.10 DOCTOR OF PHILOSOPHY IN THE BUILT ENVIRONMENT ENTRANCE REQUIREMENTS

Every candidate for this qualification shall have:

1. completed the requirements for the Master of the Built Environment;

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 module/s related to the specific field of study. Students are required to undertake research under the guidance of a supervisor.

(Amended wef 2015/08)

6. ASSESSMENT RULES

The method of assessment for each module/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 modules 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.

ADJUSTMENT OF ERRORS III (AERR301) (082506003)

Theory: 4 periods per week Tutorial: 2 periods per week

Semester Mark: Three tests - each 13.33%

Examination: One three-hour paper - 60%

SYLLABUS

1. Propagation of errors
2. Introduction to least squares
3. Network adjustment

BASIC ENGINEERING MANAGEMENT 2A (BEMN201) (8 Credits)

Theory: 2 periods per week

Continuous Assessment: Three Tests: Test 1 - 25%

Test 2 - 30%

Control-Test -3 - 45%

SYLLABUS

1. Introduction to Management
2. Construction Organisation and Management
3. The Project Team
4. Financial Management
5. Contract Management

CAD CIVIL ENGINEERING DRAWINGS 3A (CCED301) (12 Credits)

Theory: 4 periods per week

Year End Mark: Two assignments - 20% each

Examination: One three hour paper - 60%

SYLLABUS

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

CADASTRAL SURVEYING III (CSUR301) (082506403)

Theory: 3 periods per week

Tutorial: 1 period per week

Practical: 2 periods per week

Semester Mark: Two tests - 12% each

Practical - 16% (subminimum of 50% i.e. 8% of 16%)

Examination: One three-hour paper - 60%

SYLLABUS

1. Ownership
2. Subdivision and consolidation of land
3. A study of the acts relating to the survey of land

CADASTRAL SURVEYING 3A (CDSV301) (12 Credits)

Theory: 3 periods per week

Practical: 1 period per week

Semester Mark: Two Tests - 12% each

One Project – 16%

Examination: One three hour paper - 60%

SYLLABUS

1. Ownership
2. Subdivision and Consolidation of land
3. A study of the acts relating to the survey of land
4. Sectional Titles

CIVIL ENGINEERING I (CVLE101) (0806031120)

Theory: 4 periods per week

Semester Mark: One test - 10%

One project - 10%

One test - 20%

Examination: One three-hour paper - 60%

SYLLABUS

1. Introduction
2. Building Science
3. Engineering Services
4. Transport

CIVIL ENGINEERING DOCUMENTATION 3A – CEDC301 (12 Credits)

Theory: 3 periods per week

Semester Mark: Two tests – 20 % each

Exit level outcome (ELO) assessed: - ELO 6 professional and technical communication.

Examination: One Three hour paper

SYLLABUS

1. Civil Engineering Estimation
2. Extracting quantities for Roads, Earthworks, Concrete and Steel structures.
3. Compiling of a Schedule of quantities using SABS 1200
4. Clause by Clause examination or the General Conditions of Contract 2015

CIVIL ENGINEERING MATERIALS 2A (CMTL201) (12 Credits)

Theory: 3 periods per week

Practical: 1 period per week

Semester Mark: Two tests – 14% each

Practicals – 12%

Examination: One three hour paper – 60%

SYLLABUS

1. Geology
2. Soils
3. Concrete
4. Bitumen
5. Laboratory practicals

CIVIL ENGINEERING METHODS IB (CVMT101) (12 Credits)

Theory: 3 periods per week

Semester Mark: Two tests - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

1. Earthworks
2. Structures
3. Road Engineering
4. Dams
5. Bridges
6. Tunnels
7. Harbours
8. Railways
9. Airports
10. Drainage
11. Safety
12. Labour Enhanced Construction

CIVIL MECHANICS IA (CVMC101) (8 Credits)

Theory: 2 periods per week

Practical: 1 period per week

Semester Mark: Two tests - 15% each

Practicals - 10%

Examination: One three-hour paper - 60%

SYLLABUS

1. Weights and pressure.
2. Statics of beams & frames.
3. Member forces in pin jointed frames
4. Centre of gravity

COMMUNICATION SKILLS I (CSK1103) (129900312) (Serviced module)

Theory: 2 periods

Tutorials: 2 periods

For details of assessment refer to study guide

SYLLABUS

PART A

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

PART B

Applied technical writing

The structure, appropriate language and formatting conventions (numbering, citation, bibliography, integration of graphic and verbal material, etc.) pertaining to the following items, to be selected according to the needs of module discipline:

1. Project specifications
2. Technical specifications

3. Component cost estimation
4. Operating manual
5. Workshop/maintenance manual
6. Maintenance procedures
7. Project, progress, motivation, interim reports

PART C

Interpersonal skills:

1. Model of leadership styles, e.g. Blake & Mouton or Hersey & Blanchard
2. Experiential evaluation of own leadership qualities in small group situations
3. Conflict management
4. Negotiation skills

COMPUTER APPLICATIONS III (CAPP302) (060102203)

Theory: 2 periods per week

Practical: 2 periods per week

Semester Mark: Three projects - 33,33% each

Examination: No examination

SYLLABUS

1. Engineering Road Design using appropriate software
2. Program development: Writing programs in a high level language and the utilization of an application package
3. Applications: Use of applications software for certain tasks
4. Database management systems: The Design and implementation of a database

COMPUTER APPLICATIONS 3A (CPTA301) (12 Credits)

Theory: 3 periods per week

Practical: 1 period per week

Semester Mark: Two projects - 25% each

One Test - 50% (Sub-minimum of 40% for Control test)

Examination: No examination

SYLLABUS

- | | |
|--------------------------------|---------------------------------------|
| 1. File formats | 4. Data Traverse and Cadastral layout |
| 2. Engineering Road design | 5. Database Management Systems |
| 3. Engineering Platform design | |

CONSTRUCTION MANAGEMENT 3A (CNMN301) (12 Credits)

Theory: 3 periods per week

Semester Mark: Test 1 - 20%

Test 2 - 20 %

Examination: Four hour open book - 60%

SYLLABUS

1. Contract Documentation and Specifications
2. Estimating
3. Pre/post – tender procedures, planning, tender adjudication
4. Project management, quality management, disputes

CONSTRUCTION MATERIALS TECHNOLOGY IV MODULE 1 THEORY (CMTT411) (0806107060)

Theory: 4 periods per week

Semester Mark: Two tests - 20 % 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 (CMTT421) (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.

CONTROL SURVEYING 2A (CTSU201) (20 credits)

Theory: 4 periods per week

Practical: 2 periods per week

Semester Mark: Two Tests - 12% each

One Project - 16%

Examination: One three hour paper - 60%

SYLLABUS

1. Introduction
2. Reconnaissance
3. Triangulation
4. Resections
5. Trilateration
6. Satellite Positioning/GPS
7. Electronic Distance Measurement
8. Traversing
9. Trigonometrical Levelling

CONTROL SURVEYING III (CSRV301) (082508003)

Theory: 4 periods per week

Tutorial: 1 period per week

Practical: 6 periods per week

Semester Mark: Two tests - 12,50% each

Practical project - 25,00% (sub-minimum of 12,50%, i.e. 50% of 25,00% - on practical component.)

Examination: One three-hour paper - 50%

SYLLABUS

1. Triangulation
2. GPS
3. Traversing
4. Trig Heighting
5. EDM's
6. Projects

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% (restricted 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.

CORNERSTONE 101 (CSTN101) (12 Credits) (serviced module)

Theory: 4 periods per week

Semester Mark:

A weekly reflective journal or blog written by each student - 25%

Tutorial attendance (forfeited if student attends less than 80% of tutorials) - 10%

A major project involving work with family oral history - 35%

Oral presentation - 20%

Peer assessment - 10%

Examination: No Examination

SYLLABUS

1. The Common Set of Values
2. Introduction to journeys: our journeys and those of others
3. Diversity, social groups
4. Diversity, the Constitution and the Bill of Rights
5. Gender diversity
6. Gender and gender-based violence
7. HIV/AIDS and society

DESIGN PROJECT (DSNP301) (20 Credits)

Project: 2 periods per week

Semester mark: Oral Presentation of project = 50% of the final mark.

Project Submission = 50% of the final mark.

Sub-minima: You must obtain a minimum for the oral presentation mark of at least 50% in order to pass. You must also obtain at least 50% in the submission part to pass.

Examination: No examination

SYLLABUS

1. A design project.

DIGITAL PHOTOGRAMMETRY AND REMOTE SENSING 2B (DPRS201)

(12 Credits)

Theory: 3 periods per week

Practical: 2 periods per week

Semester Mark: Two tests - 10% each

One project - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

1. Introduction
2. Theory of electromagnetic radiation
3. Remote sensing systems
4. Multispectral scanners
5. Radar instruments
6. Image acquisition, processing and interpretation
7. Photogrammetric image system calibration
8. Data reduction, and error analysis
9. Stereoscopic instrumentation
10. Object space control
11. Mission planning

DIGITAL PHOTOGRAMMETRY IV (DPHT401) (0825073060)

Theory: 5 periods per week

Semester Mark: Two tests - 12% each

One Project - 16%

Examination: One three-hour paper - 60%

SYLLABUS

1. Cameras and sensors
2. Mapping: the exact solution
3. Differential rectification
4. Close-range photogrammetry

DOCUMENTATION III - MODULE I (DOCU311)

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 (DOCU321)

Practical: 1 period per week

Semester Mark: 2 Computer competency assignments 50% each (sub-minimum 25% each, ie 50% of 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. 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

DRAWINGS IA – DRNS101 (12 Credits)

Theory: 3 periods per week

Semester Mark: Two tests – 20 % each

Examination: One Three hour paper

SYLLABUS

1. Drawing office practice
2. General Drafting skills
3. Civil engineering drawing applications and Autocad software

ENGINEERING MANAGEMENT 2A (ENMG201) (8 Credits)

Theory: 2 periods per week

Tutorial: 1 period per week

Semester Mark: Test 1 - 25%

Test 2 - 25%

Final Control Test - 40%

Assignment - 10%

Examination: No Examination

SYLLABUS

1. Contract planning
2. Planning techniques
3. Financial planning and control
4. Computer applications –MS Projects

ENGINEERING MATHEMATICS IA – EMTA101 (12 Credits) (served module)

Notional hours: 120 hours

4 lectures per week

1 tutorial per week

FINAL MARK = (Major Test 1 x 0.4) + (Major Test 2 x 0.4) + (Class Mark x 0.2)

The Class mark is obtained by taking the best 2 out of 3 class tests and/or assignments.

The pass mark is 50%

If a student obtains a final result from 45% to 49% inclusive for Maths IA he/she will be eligible to write a 3- hour SPECIAL test covering the whole syllabus. If a student passes the Special test, he/she will be allocated a final result of 50%.

SYLLABUS

1. Number and Algebra
2. Areas and Volumes
3. Logarithms
4. Exponents
5. Hyperbolic Functions
6. Trigonometry
7. Graphs
8. Complex Numbers
9. Calculus - Differentiation
10. Calculus – Integration

ENGINEERING MATHEMATICS IB – EMTB101 (12 Credits) (serviced module)

Notional hours: 120 hours

4 lectures per week

1 tutorial per week

FINAL MARK = (Major Test 1 x 0.4) + (Major Test 2 x 0.4) + (Class Mark x 0.2)

The Class mark is obtained by taking the best 2 out of 3 class tests and/or assignments.

The pass mark is 50%.

If a student obtains a final result from 45% to 49% inclusive for Maths IB he/she will be eligible to write a 3- hour SPECIAL test covering the whole syllabus. If a student passes the Special test, he/she will be allocated a final result of 50%.

SYLLABUS

1. Linear Algebra
2. Trigonometry
3. Complex Numbers
4. Series
5. Advanced Calculus – Differentiation
6. Advanced Calculus – Integration
7. Statistics and Probability

ENGINEERING MATHEMATICS 2A – EMTA201 (12 Credits) (serviced module)

Notional hours: 120 hours

4 lectures per week

1 tutorial per week

FINAL MARK = (Major Test 1 x 0.4) + (Major Test 2 x 0.4) + (Class Mark x 0.2)

The Class mark is obtained by taking the best 2 out of 3 class tests and/or assignments.

The pass mark is 50%

If a student obtains a final result from 45% to 49% inclusive for Maths IIA he/she will be eligible to write a 3- hour SPECIAL test covering the whole syllabus. If a student passes the Special test, he/she will be allocated a final result of 50%.

SYLLABUS

1. Partial Differential Equations
2. Statistics and Probability
3. Differential Equations
4. Laplace Transforms
5. Fourier Series

ENGINEERING MATHEMATICS 2B – EMTB201 (12 Credits) (serviced module)

Notional hours: 120 hours

4 lectures per week

1 tutorial per week

FINAL MARK = (Major Test 1 × 0.4) + (Major Test 2 × 0.4) + (Class Mark × 0.2)

The Class mark is obtained by taking the best 2 out of 3 class tests and/or assignments.

The pass mark is 50%

If a student obtains a final result from 45% to 49% inclusive for Maths IIB he/she will be eligible to write a 3- hour SPECIAL test covering the whole syllabus. If a student passes the Special test, he/she will be allocated a final result of 50%.

SYLLABUS

1. Analysis and Calculus
2. Linear Algebra
3. Vector Analysis
4. Complex Analysis

ENGINEERING PRACTICE: CIVIL II - MODULE 1 (EXCV201)

At least 25 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 II —MODULE 2 (EXCV301)

At least 25 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 will be orally assessed.

Obtaining a Learners Drivers Licence (Students with a valid learners or drivers licence will be exempted from this component.)

ENGINEERING PHYSICS IA (EPHA 101) (12 Credits) (serviced module)

Theory: 2 period per week

Tutorial: 2 period per week

Practical: 2 period per week

Semester mark: Two tests – 15% each + one written practical test – 10%

Examination: One three-hour paper – 60%

SYLLABUS

1. Units, physical quantities, vectors
2. Equilibrium of a particle
3. Newton's second law, gravitation
4. Work and energy
5. Impulse and momentum
6. Torque

- | | |
|---------------------|------------------------|
| 7. Elasticity | 10. Vibrating bodies |
| 8. Periodic motion | 11. Acoustic phenomena |
| 9. Mechanical waves | |

ENGINEERING PHYSICS IB (EPHB 101) (12 Credits) (serviced module)

Theory: 2 period per week

Tutorial: 2 period per week

Practical: 2 period per week

Semester mark: Two tests – 15% each + one written practical test – 10%

Examination: One three-hour paper – 60%

SYLLABUS

1. Atomic and molecular structure
2. Coulomb's law
3. Current, resistance and capacitance
4. Magnetic field
5. Inductance
6. Maxwell's equation
7. Electromagnetic waves
8. Nature and propagation of light
9. Thermodynamics

ENGINEERING SURVEYING 2B (ENSV201) (24 credits)

Theory: 4 periods per week

Practical: 4 periods per week

Semester Mark: Two Tests – 10% each

Three projects (2 x 8% & 1x 4%) - 20%

Examination: One three hour paper – 60%

SYLLABUS

1. Basic principles of Engineering Surveying
2. Interpretation of engineering drawings
3. Geometric design: including principles and practice of road alignment
4. Design control and criteria
5. Principles of precise setting out
6. Deformation surveys
7. Setting out of engineering works
8. Areas and volumes

ENVIRONMENTAL SCIENCE IB (EVSCI01) (12 Credits)

Theory: 3 periods per week

Semester Mark: Two tests - 15% each

Project - 10%

Examination: One three-hour paper - 60%

SYLLABUS

- | | |
|----------------------------|--|
| 1. Climatology | 5. Geomorphology |
| 2. Human settlements | 6. Astronomical Geography |
| 3. Oceanography | 7. Geographical Maps |
| 4. Properties of the Earth | 8. Geographical properties of South Africa |

FINANCIAL MANAGEMENT I (FIMG101) (40925712)

Theory: 5 periods per week

Semester Mark: Three tests - 33.33% each

Examination: One three hour paper - 60%

SYLLABUS

1. Accounting Information System
2. Financial Statements
3. Financial Analysis and Interpretation of Financial Statements
4. Cost and Management Accounting

FOUNDATION ENGINEERING IV MODULE 1 THEORY (FNDE411) (0806110060)

Theory: 4 periods per week

Semester Mark: Two tests - 20%

Examination: One three-hour paper - 60%

SYLLABUS

1. Shallow & deep foundation design
2. Lateral earth support

FOUNDATION ENGINEERING IV MODULE 2 PROJECT (FNDE421) (0806110060)

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.

GEODESY 3A (GDSY301) (16 credits)

Theory: 4 periods per week

Practical: 1 period per week

Semester Mark: Two Tests - 10% each

One Project – 20%

Examination: One three hour paper - 60%

SYLLABUS

1. Introduction to Geodesy
2. Gravimetry
3. Theory of the Gravity Field of the Earth.
4. Satellite Geodesy.
5. Geodetic control networks

GEODESY IV (GEOD402) (0825077060)

Theory: 5 periods per week

Semester Mark: Six assignments - 10% each

Two tests – 20%

Examination: No examination

SYLLABUS

1. Co-ordinate systems in two dimensions
2. Co-ordinate systems in three dimensions
3. Co-ordinate systems for the earth
4. Geodetic surveying

GEOGRAPHIC INFORMATION SYSTEM 2A (GISS201) (12 Credits)

Theory: 3 periods per week

Practical: 2 periods per week

Continuous Assessment

Two tests - 20% each

Practical - 25%

Control Test - 35%

SYLLABUS

1. Introduction and Fundamentals of Geographic Information System.
2. Spatial Concepts
3. Spatial Data types
4. Geo-referencing and Geo-coding
5. GIS Hardware and Software
6. Data input and output
7. Data analysis

GEOGRAPHICAL INFORMATION SYSTEMS III (GEIS301) (060599903)

Theory: 2 periods per week

Practical: 2 periods per week

Semester Mark: One test - 20%

Two Assignments - 20% and 25% each

One Control Test - 35%

Examination: No examination module continuously assessed

SYLLABUS

1. Fundamentals of GI
2. Spatial Concepts
3. Spatial Data
4. GIS Hardware and Software
5. GIS Data Analysis
6. GIS Output
7. Practical Output of GIS

GEOGRAPHIC INFORMATION SYSTEM (GIS) 3A (GISS301) (12 Credits)

Theory: 3 periods per week

Practical: 2 periods per week

Continuous Assessment

Two tests - 20% each

Practical - 25%

Control Test - 35%

SYLLABUS

1. Raster and vector GIS & its Capabilities
2. Representing Reality, Sampling, Data sources, standards & accuracy
3. Spatial Objects & Database Models
4. Spatial Analysis
5. Graphic Output Design
6. Generating Complex Products.

GEOGRAPHIC INFORMATION SYSTEMS IV (GISY402) (0605019060)

Theory: 5 periods per week

Semester Mark: Two tests - 20% each

Two projects - 20% each

One Control Test - 20%

Examination: No examination

SYLLABUS

1. Nature of Geo-referenced information
2. Data capture
3. Data analysis
4. Presentation of information

GEOMATICS IA (GMTA101) (16 Credits)

Theory: 4 periods per week

Practical: 2 periods per week

Semester Mark: Two tests - 12% each

Practical - 16% (Sub-minimum of 8% i.e. 50% of 16% for practical component)

Examination: One three-hour paper - 60%

SYLLABUS

1. Basic principles of Surveying
2. Introduction to Map projections and co-ordinates systems.
3. Various methodologies involved in the determining of heights, (including levelling of control points, Long sections and Cross sections).
4. Co-ordinates calculations
5. Detail Survey & vertical sections (gradients)
6. Area and volumes

GEOMATICS IB (GMTB101) (16 Credits)

Theory: 4 periods per week

Practical: 3 periods per week

Semester Mark: Two tests - 12% each

Practical - 16% (Sub-minimum of 8% i.e. 50% of 16% for practical component)

Examination: One three-hour paper - 60%

SYLLABUS

1. Introduction to Geomatics and Surveying
2. Errors and Standards
3. Map Projection and Co-ordinate systems
4. Co-ordinate calculations (Triangulation)
5. Introduction to Global Positioning systems (GPS)
6. Instruments and equipment
7. Trigonometrical levelling
8. Electronic Distance Measurements (EDM)
9. Traversing
10. Engineering/Construction surveying
11. Area and volumes

GEOMETRIC DESIGN IV MODULE I THEORY (GMDS411) (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 (GMDS421) (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 (GTEN201) (15056822)

Theory: 3 periods per week

Practical: 1 period per week

Semester Mark: Two tests - 14% each

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 IIB (GEOT201) (12 Credits)

Theory: 3 periods per week

Practical: 2 periods per week

Semester Mark: Two tests – 14% each

Three practicals (4% each) – 12%

Examination: One three hour paper

SYLLABUS

1. Properties of soils
2. Flow of water through soils
3. Effective stresses
4. Shear strength of soils
5. Consolidation
6. Shallow foundations
7. Site investigations
8. Laboratory practicals

GEOTECHNICAL ENGINEERING III - MODULE 1 (GTEN311)

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 (GTEN321)

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 (HYDR412) (0806112060)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

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

HYDRAULICS IV MODULE 2 PROJECT (HYDR422) (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 (HLGY411) (0806113060)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

- | | |
|--------------------------------|-------------------|
| 1. Introduction to meteorology | 3. Surface water |
| 2. Groundwater | 4. Flood analysis |

5. Water resources analysis
6. South African hydrology

HYDROLOGY IV MODULE 2 PROJECT (HLGY421) (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 (IRNG211) (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 (IRNG221) (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.

LAW FOR LIFE (LWLF101) (8 Credits) (serviced module)

Theory: 1 period per week

Tutorial: 1 period per week

Semester Mark: Two assignments - 50% each (chance to re-submit in the event of obtaining a mark of less than 50%)

No Examination; 100% course mark

SYLLABUS

1. Introduction to Law
2. Civil and Criminal Law
3. Law of Insurance
4. Road Accident Fund
5. Law of Contract
6. Marriage
7. Succession

LEGAL PRINCIPLES I (LPRN101) (130402612) (Serviced Module)

Theory: 4 periods per week

Semester Mark: Three tests - the best two shall each count 20%

Examination: One three - hour paper - 60%

SYLLABUS

1. Introduction
2. S A system of government
3. Ownership
4. Function of Surveyor-General and Registrar of Deeds

LEGAL PRINCIPLES 2B (LPPL201) (12 Credits)

Theory: 3 periods per week

Semester Mark: Two tests - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

1. An introduction to South African Law
2. Legislation as a source of law
3. The Constitution
4. The Law of property
5. The Law of things
6. The Law of contract
7. An introduction to Land reform in South Africa
8. Land Legislation applicable in South Africa
9. Legislation for Surveying students

MANAGEMENT: CIVIL II - MODULE I (MCIV211)

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 (MCIV221)

Practical: 1 period per week

Semester Mark: Computer competency assignment - 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 calendar charts
5. Adjusting schedules
6. Levelling of resources

7. Tracking progress - creating baseline programs
8. Reporting - progress

MANAGEMENT PRINCIPLES & PRACTICE IV MODULE 1 THEORY (MTPP411) (0409226060)

Theory: 4 periods per week

Semester Mark: 2 tests - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

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

MANAGEMENT PRINCIPLES & PRACTICE IV MODULE 2 PROJECT (MTPP421) (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.

MAP PROJECTIONS AND COORDINATE SYSTEMS 2A (MPSC201) (12 Credits)

Theory: 3 periods per week

Practical: 2 periods per week

Semester Mark: Two tests - 10% each

One project - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

1. Two- and three-dimensional coordinate systems
2. Grid reference systems, shape of the Earth
3. Mathematical representations of the Earth, (including reference ellipsoids)
4. Geographical coordinates, different types of map projections, Including mathematical models and projection properties)
5. Reference datums and common ellipsoids
6. SA Survey co-ordinate system and UTM system
7. Projection-to-projection transformations

MATHEMATICS II (MATH201) (160404122) (MTHD201) (Serviced module)

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. $2 \times 40 = 80$). 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 | 3. First order differential Equations |
| 2. Integration II | 4. Matrices |

PAVEMENT TECHNOLOGY IV MODULE 1 THEORY (PVTC411) (0806114060)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One 4-hour paper - 60% (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 (PVTC421) (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.

PHOTOGRAMMETRY II (PHTG202) (082505522)

Theory: 3 periods per week

Practical: 2 periods per week

Semester Mark: Two tests - 10,00 % each

Two practicals - 10,00 % each

Examination: One three - hour paper - 60%

SYLLABUS

- | | |
|-------------------|--------------------------------------|
| 1. Applications | 3. The geometry of the photograph |
| 2. The photograph | 4. Mapping: The approximate solution |

PHOTOGRAMMETRY 2A (PHGR201) (12 Credits)

Theory: 3 periods per week

Practical: 2 periods per week

Semester Mark: Two tests - 10% each

Two projects - 10% each

Examination: One three-hour paper - 60%

SYLLABUS

1. Geometry of sensors and sensor systems (airborne, space borne and terrestrial)
2. Camera calibration, acquisition of images (including flight planning)
3. Image media and formats incl. image compression
4. Principles of analogue and digital photography, Ortho-rectification, mosaicing and geo-referencing

PHOTOGRAMMETRYIII (PHTG302)

Theory: 3 periods per week

Practical: 2 periods per week

Course Mark: Two tests - 13.33% each

Practical - 13.33%

Examination: One three-hour paper - 60%

SYLLABUS

1. The photograph
2. Mapping: exact solution
3. Computer applications in photogrammetry

PHOTOGRAMMETRY IV (PHTG401) (0825075060)

Theory: 5 periods per week

Semester Mark: Method of assessment to be decided

Examination: One three-hour paper - 60%

SYLLABUS

1. Photogrammetry project design
2. Graphic output
3. Image interpretation
4. Photogrammetric office organisation
5. Image processing

PRACTICE MANAGEMENT IV (PRMT401) (0409258060)

Theory: 5 periods per week

Semester Mark: Two tests - 13,33% each

One assignment - 13,33%

Examination: One three-hour open book paper- 60%

SYLLABUS

1. Human relations in organisations
2. Principles & practice of management
3. Project management

PRESTRESSED CONCRETE DESIGN IV MODULE 1 THEORY (PCDS411) (0806115060)

Theory: 4 periods per week

Semester Mark: Two tests - 20%

Examination: One 4-hour paper - 60% (open book)

SYLLABUS

1. Design of pre-stressed concrete structures
2. Working details & drawings

PRESTRESSED CONCRETE DESIGN IV MODULE 2 PROJECT (PCDS421) (0806115060)

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 (PMCV311) (2202006030)

Theory: 4 periods per week

Semester Mark: Two test - 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 (PMCV321) (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 (PMAN301) (8 Credits) (serviced module)

Theory: 2 periods per week

Semester Mark: Test - 30%

Computer practical - 15%

Assignment - 15%

Final Control test - 40%

Examination: No Examination

SYLLABUS

1. Project Management within Context
2. Modern Project planning methods, tool, analysis and computer applications
3. Oral and written communication of project planning
4. Project Implementation Support of the operational systems

PROJECT MANAGEMENT IV (CIVIL) MODULE 1 THEORY (PRJM412) (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 (PRJM422) (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 DESIGN IV MODULE 1 THEORY (RCDE412) (0806118060)

Theory: 4 periods per week

Semester Mark: Two tests - 20%

Examination: One 4-hour paper - 60% (restricted open book)

SYLLABUS

1. Design of reinforced concrete structures
2. Computer applications
3. Working details and drawings

REINFORCED CONCRETE DESIGN IV MODULE 2 PROJECT (RCDE422) (0806118060)

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 I (RCMD311)

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 (RCMD321)

Practical: 1 period per week

Semester Mark: Assessment 1 - 70% (subminimum 35%, ie 50% of 70%)

Assessment 2 - 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

REINFORCED CONCRETE DESIGN 3A (RFCD301) (12 Credits)

Theory: 3 periods per week

Semester Mark: Two tests - 20% each

Exit level outcome (ELO) assessed: - ELO 2 application of scientific and engineering knowledge

Examination: One 3-hour paper - 60% (restricted open book)

SYLLABUS

1. Application of Loads
2. Moment Distribution and re-distribution
3. Beams
4. Slabs
5. Columns
6. Foundations
7. Retaining Walls

RETICULATION DESIGN & MANAGEMENT IV MODULE 1 THEORY (RDMT411) (0806119060)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

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

RETICULATION DESIGN & MANAGEMENT IV MODULE 2 PROJECT (RDMT421) (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.

SETTLEMENT HISTORY 101 (STHS102) (8 Credits)

Theory: 2 periods per week

Semester Mark: Two tests - 15% each

One project - 20%

Examination: One three-hour paper - 50%

Syllabus

SECTION I: deals with the Classical Period. In this section the principles and practise in the Classical Period is outlined. Classical developments are the foundations of Western civilization. The concepts, methods, principles and examples are conveyed in the following time frames:

- Pre-history and Early Cities
- Greek period
- Roman Empire period
- Medieval period

SECTION II: deals with Contemporary Cities and the Evolution of the South African City. This section puts in perspective the attitudes, events, policy and regulations which have shaped the South African city and society.

The sub-sections are as follows;

- Pre-colonial societies, space and settlement patterns in South Africa
- The Renaissance City
- The Industrial City and the Garden City response
- Early 20th Century developments, The New Town Movement
- African Cities

SOCIOLOGY OF WORK 101 (SCLW101) (8 Credits)

Theory: 2 periods per week

Semester Mark:

The approach will be one of continuous assessment.

The assessment will be made up as follows:

This is how will outcomes be assessed.

Tutorial attendance - 15%

Submission of all tutorials - 20%
Blackboard (online) Exercises - 15%
Group Project - 20%
Submission of a 4-5page written assignment - 30%
Examination: No Examination

SYLLABUS

1. What is Work?
2. Industrialisation and post industrialisation
3. The capitalist workplace
4. Trade unionism
5. Women and Work
6. Precarious Labour

SOLID WASTE MANAGEMENT IV MODULE 1 THEORY (SWMT411) (0806120060)

Theory: 4 periods per week
Semester Mark: Two tests - 20% each
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 (SWMT421) (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.

STATISTICS I (STAS101) (160802412) (Serviced module)

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

Semester Mark: The semester mark will be calculated from tests and/or assignments done during the semester concerned. Details of how the semester mark will be calculated, as well as the procedure to be followed for tests that are missed are included in the module study guide.

Examination: One three-hour paper - 60%

The onus is on the student rewriting Statistics I to familiarise himself regarding any changes to module syllabus content.

SYLLABUS

1. Descriptive statistics
2. Inferential statistics

STATISTICS 2B (STST201) (12 credits)

Theory: 3 periods per week

Semester Mark: Three Tests – 13.33% each

Examination: One three hour paper - 60%

SYLLABUS

1. The nature of observations and data acquisition,
2. Types of errors,
3. Means, norms, accuracy, precision,
4. Reliability, probability, confidence intervals,
5. Distributions and probability density functions
6. Auto- and cross-correlation,
7. Hypothesis testing

STRUCTURAL ANALYSIS II - MODULE I (SANA211)

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 (SANA221)

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 2B (STAN201) (12 Credits)

Theory: 3 periods per week

Practical: 1 period per week

Semester Mark: 2 tests- 20% each

Examination: One three-hour paper - 60%

Syllabus

1. Analysis of statically indeterminate structures

STRUCTURAL ANALYSIS III - MODULE 1 (SANA311)

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 (SANA321)

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 ANALYSIS IV MODULE 1 THEORY (SANA411) (0806121060)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

1. Advanced structural analysis methods
2. Applicable computer applications

STRUCTURAL ANALYSIS IV MODULE 2 PROJECT (SANA421) (0806121060)

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 DESIGN THEORY INTRO 2B (SDTI201) (16 Credits)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One 3-hour paper - 60% (restricted open book)

SYLLABUS

1. Loading and Limit State Design Philosophy
2. Structural Steel Ties, Struts and Beams
3. Reinforced Concrete Beams

STRUCTURAL MECHANICS IB - MODULE 1 (STMC101) (12 Credits)

Theory: 3 periods per week

Practical: 1 period per week

Semester Mark: Two tests - 15% each

Practical - 10% (library research is required for the project)

Examination: One three-hour paper - 60%

SYLLABUS

1. Section Properties
2. Shear Centroids
3. Stress and Strains
4. Impact Loads
5. Mohrs Circle

STRUCTURAL MECHANICS 2A - MODULE I (STMC201) (12 Credits)

Theory: 3 periods per week

Practical: 1 period per week

Semester Mark: Two tests - 15% each

Practical - 10% (library research is required for the project)

Examination: One three-hour paper - 60%

SYLLABUS

1. Moment Area Method
2. Shear Forces, Bending Moments and Deflection of Statically Determinate Structures
3. Shear Centroids
4. Combined Stresses
5. Torsion

STRUCTURAL STEEL DESIGN 3B - (STSD301) (12 Credits)

Theory: 3 periods per week

Continuous Assessment

Two tests - 20% each (Theory, restricted open book -combined subminimum 50%)

Control test: - 60% (open book, 2 parts, computer based, subminimum 60%)

The computer based assessment will be carried out in a computer venue with appropriate software. Student will have to demonstrate that he/she has achieved the following outcomes; A student must be able to derive the appropriate loading, analysis and design a given steel structure using prescribed structural software.

Exit level outcome (ELO) assessed: - ELO 5 Engineering methods, skills, tools, including information technology.

SYLLABUS

1. Structural loading and analysis
2. Structural steel design

STRUCTURAL STEEL AND TIMBER DESIGN III - MODULE I (STTD311)

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 (STTD321)

Practical: 1 period per week

Semester Mark: Two competency control tests - 50% each (subminimum of 50% on each ie 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

STRUCTURAL MASONRY DESIGN IV MODULE 1 THEORY (SMDE411) (0806123060)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One 4-hour paper - 60% (restricted open book)

SYLLABUS

1. Design of unreinforced masonry structures
2. Design of reinforced masonry elements
3. Computer applications
4. Working details & drawings

STRUCTURAL MASONRY DESIGN IV MODULE 2 PROJECT (SMDE421) (0806123060)

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 STEEL DESIGN IV MODULE 1 THEORY (SSDE411) (0806124060)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One 4-hour paper - 60% (restricted open book)

SYLLABUS

1. Design of structural steel structures
2. Computer applications
3. Working details & drawings

STRUCTURAL STEEL DESIGN IV MODULE 2 PROJECT (SSDE421) (0806124060)

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 TIMBER DESIGN IV MODULE 1 THEORY (STDE411) (0806125060)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One 4-hour paper - 60% (restricted open book)

SYLLABUS

1. Design of timber structures
2. Computer applications
3. Working details & drawings

STRUCTURAL TIMBER DESIGN IV MODULE 2 PROJECT (STDE421) (0806125060)

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

SURVEYING II - MODULE 1 (SURV212) (082504222)

Theory: 3 periods per week

Practical: 3 periods per week

Semester Mark: Two tests - 12% each

Practical - 16% (sub-minimum of 8%, i.e. 50% of 16%, for practical component)

Examination: One three-hour paper - 60%

SYLLABUS

1. Triangulation
2. EDM and lasers
3. Levelling
4. Area/strip surveys
5. Construction surveys

SURVEYING II - MODULE 2 (SURV222)

Practical: 1 period per week

Semester Mark: Two instrument competency tests - 50% each (sub-minimum of 70% on each)

Examination: No examination

SYLLABUS

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

SURVEYING III (SURV302) (082508103)

Theory: 4 periods per week

Tutorial: 1 period per week

Practical: 6 periods per week

Semester Mark: Two tests - 12,50% each

Practical projects - 25% (sub-minimum of 12,50%, i.e. 50% of 25%, for practical component)

Examination: One three-hour paper - 50%

SYLLABUS

1. Precise surveying
2. Co-ordinate transformation
3. Vertical Alignment
4. Horizontal Alignment
5. Construction Surveying
6. Instruments
7. Projects

SURVEYING IV (SURV403) (0825078060)

Theory: 5 periods per week

Semester Mark: Two tests - 10% each

Two projects - 10% each

Examination: One three-hour paper - 60%

SYLLABUS

1. Instrumentation for precise surveying
2. Observation methods of precise surveying
3. Calculation methods of precise surveying

SURVEYING FOR CIVIL ENGINEERING IB (SRCV101) (16 Credits)

Theory: 4 periods per week

Practical: 2 periods per week

Semester Mark: Two tests - 10% each

Practical - 20% (sub-minimum of 10%, ie. 50% of 20% for practical

component)

Examination: One three-hour paper - 60%

SYLLABUS

1. Basic principles
2. Co-ordinate Calculations
3. Levelling
4. Tacheometry
5. Gradients
6. Creation and interpretation of long and cross sections
7. Areas and volumes
8. Setting out civil engineering structures

SURVEY DRAWING IB (SVDRI01) (12 Credits)

Theory: 3 periods per week

Semester Mark: Two CAD projects - 25% each

One Test - 50% (Sub-minimum of 40% for Control test)

Examination: No examination

SYLLABUS

1. Introduction to basic CAD
2. Survey symbols
3. Survey Calculations
4. Digital terrain models (DTM) and Contouring
5. Hatching
6. Definition of CAD layers
7. Identification and manipulation of CAD elements
8. Survey Diagrams
9. General Plans
10. Detail Plan

SURVEY DRAWING II - MODULE I - (SDRG212)

Theory: 2 periods per week

Semester Mark: Two tests - 40% each

One assignment - 20%

Examination: No examination

SYLLABUS

1. Introduction
2. Sections
3. Map production
4. Reproduction

SURVEY DRAWING II - MODULE 2 - (SDRG222)

Practical: 2 periods per week

Semester Mark: Two CAD projects - 25%, 25%

One test - 50%

Examination: No examination

SYLLABUS

1. Introduction
2. Sections
3. Map production
4. Reproduction

SURVEY PROJECT IV (SVPR401)

Theory: 5 periods per week

Semester Mark: Continuous assessment by means of industry related projects

Examination: No examination

SYLLABUS

A number of industry orientated tasks must be completed by the student.

Based on a sound investigation a comprehensive report discussing the analysis and solution or completion of the task must be submitted.

SURVEY PRACTICE II - (EXSV201)

Evaluation: Continuous evaluation by the University in collaboration with the supervisory officer

SYLLABUS

At least one year of experiential training under the supervision of a qualified mentor in the following categories of Surveying work:

1. Levelling
2. Traverse
3. Triangulation
4. Trigonometrical levelling
5. Computer data processing
6. Detail surveying
7. Construction surveying

Obtain a Code 8 Drivers License or higher

SURVEY PROJECT 3B (SVPJ301) (32 credits)

Theory: 4 periods per week

Continuous Assessment

Seven Assignments:

- 1) Assignment 1 - 11% of the FM
- 2) Assignment 2 - 11% of the FM
- 3) Assignment 3 - 11% of the FM
- 4) Assignment 4 - 11% of the FM
- 5) Assignment 5 - 11% of the FM
- 6) Mini Dissertation - 40% of the FM
- 7) Skills Test - 5% of the FM (Sub-minimum of 70% is required to pass)

SYLLABUS

1. Introduction
2. Research Methodology
3. Computing for geomatics
4. Survey Drawing
5. Control Surveying
6. Engineering Survey
7. Cadastral Surveying
8. GIS

TECHNICAL LITERACY TCLT101 (8 Credits) (served module)

Theory: 2 periods per week

Semester Mark: Test one – 20 %

Test two – 30 %

Report one – 20 %

Report two – 30 %

Examination: No examination

SYLLABUS

1. Technical Report writing
2. Referencing Practice
3. Utilising spreadsheets for graphical representation of information

THE GLOBAL ENVIRONMENT (GENV101) (8 credits)

Theory: 2 periods per week

Continuous Assessment

Three Assignments:

- 1) Presentation at a Student Nations Summit. PowerPoint Presentation on a given topic at mock conference (30%)
- 2) Web based assignment on carbon footprint (30%)
- 3) Problem based learning assignment on the interrelationships between the different issues affecting the environment (40%).

SYLLABUS

1. Environmental Pollution (Air, water and soil)
2. Population growth vs. natural resources
3. Climate change and global warming
4. Sustainable development

THEORY OF ERRORS AND NETWORK ADJUSTMENT 3A (TENA301)

(20 Credits)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

1. Least squares theory
2. Simple and multiple regression
3. Distribution functions
4. Law of error propagation

5. Least squares adjustments of survey observations
6. Network adjustment

THEORY OF STRUCTURES II (TSTR202) (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%

SYLLABUS

1. Sectional properties
2. Stress and strain
3. Analysis of statically determinate beams
4. Analysis of statically determinate pin-jointed frames

THEORY OF STRUCTURES IV MODULE 1 THEORY (TSTR412) (0806132060)

Theory: 4 periods per week

Semester Mark: Two tests - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

1. Advanced structural theory & analysis
2. Applicable computer applications

THEORY OF STRUCTURES IV MODULE 2 PROJECT (TSTR422) (0806132060)

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.

TOWN & REGIONAL PLANNING: LAYOUT & DESIGN 3A (TRLD301)

(12 credits)

Theory: 3 periods per week

Semester Mark: Two Tests - 12% each

One Project – 16%

Examination: One three hour paper - 60%

SYLLABUS

1. An introduction to the nature of Town Planning.
2. Understanding of the sizes of lots for different types of residential development.
3. Locational distribution of different land use types.
4. A differentiated road hierarchy and appropriate road reserve cross-section.
5. Underlying Concepts and Principles.

TOWN PLANNING IV (TNPL401) (0211013060)

Theory: 5 periods per week

Semester Mark: Two tests - 12% each

One project - 16%

Examination: One three-hour paper - 60%

SYLLABUS

1. Introduction
2. Land use
3. Township design
4. Planning law & procedures

TRAFFIC ENGINEERING IV MODULE 1 THEORY (TENG411) (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 (TENG421) (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.

TRANSPORT TECHNOLOGY 2A - (TRTA201) (12 Credits)

Theory: 3 periods per week

Semester Mark: Two tests - 20% each

Examination: One three-hour paper - 60%

SYLLABUS

1. Traffic Engineering
2. Route Location
3. Design Criteria
4. Horizontal Alignment
5. Vertical Alignment
6. Cross Sectional Elements
7. Access Design
8. Rail Design
9. Earthworks Design

TRANSPORT TECHNOLOGY 2B (TRTB201) (12 Credits)

Theory: 3 periods per week

Semester Mark: Test 1 - 15%

Test 2 - 15 %

Lab Practicals - 10 %

Examination: One three hour open book paper - 60%

SYLLABUS

1. Pavement design
2. Drainage design
3. Seal design
4. Pavement rehabilitation

TRANSPORT TECHNOLOGY 3A (TRTA301) (16 Credits)

Theory: 4 periods per week

Semester Mark: Test 1 - 20%

Test 2 - 20 %

Exit level outcome (ELO) assessed: - ELO 4 investigation

Examination: One four hour open book paper - 60%

SYLLABUS

1. Transport planning
2. Transport technology
3. Traffic engineering

TRANSPORT TECHNOLOGY 3B - (TRTB301) (12 Credits)

Theory: 3 periods per week

Semester Mark: Two tests - 20% each

Exit level outcome (ELO) assessed: - ELO I Problem solving

Examination: One three-hour paper - 60%

SYLLABUS

- | | |
|--------------------------------|-----------------------------|
| 1. Transportation Planning | 5. Vertical Alignment |
| 2. Route Location | 6. Cross Sectional Elements |
| 3. Basic Design Considerations | 7. Intersection Design |
| 4. Horizontal Alignment | 8. Interchange Design |

TRANSPORTATION ENGINEERING II - MODULE I (TPEN211)

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 | 4. Rail design |
| 2. Traffic engineering | 5. Earthwork design |
| 3. Geometric design | 6. Design project |

TRANSPORTATION ENGINEERING II - MODULE 2 (TPEN221)

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 | 4. Vertical alignment |
| 2. Contouring | 5. Access design |
| 3. Horizontal alignment | 6. Mass haul diagram |

TRANSPORTATION ENGINEERING III - MODULE 1 (Theory) (TPEN311)

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) (TPEN321)

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 (TPEN331)

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 (TPLN411) (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 (TPLN421) (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 (TPTE411) (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 (TPTE421) (0806128060)

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.

URBAN PLANNING & DESIGN IV MODULE 1 THEORY (UPDS411) (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 (UPDS421) (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 (WWTT412) (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 (WWTT422) (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) (WENG213) (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) (WENG223) (080609822)

Theory: 3 periods per week

Semester Mark: One test - 20% each

One open book design assessment - 20% each

(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) (WENG313)

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) (WENG323)

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 | 3. Pipelines and steel pipeline design |
| 2. Pumping principles | 4. Basic water supply provision |

WATER ENGINEERING III - MODULE 3 (WENG333)

Practical: 1 period per week

Semester Mark: One Watercad assignment - 60%

One Watercad assignment - 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 design software packages and will cover the following aspects:

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

WATER/HYDRAULICS 2A (WHYD201) (12 Credits)

Theory: 3 periods per week

Practical: 1 period per week

Semester Mark: Two tests – 10% each; practical report 20%

Examination: One three-hour paper – 60%

SYLLABUS

1. Hydrostatic principles
2. Buoyancy
3. Momentum and fluid flow
4. Pipeline flow
5. Pump design
6. Open channel flow

WATER/HYDROLOGY 2B (WHDL201) (12 Credits)

Theory: 3 periods per week

Semester Mark: Two tests – 20% each

Examination: One three-hour paper – 60%

SYLLABUS

1. Hydrology principles
2. Surface run-off
3. Flood routing
4. Hydrological forecasting
5. Flood determination

WATER RETICULATION DESIGN 3A (WRTD301) (12 Credits)

Theory: 3 periods per week.

Practical: 1 period per week

Semester Mark: One Test – 20%

One assignment – 20%

Examination: One three hour paper – 60%

SYLLABUS

1. Hydraulic principles such as flow, water hammer, networks, Hardy- Cross and pipes not flowing full.
2. Design Principles such as the requirement for air valves, valves, pressure and flow regulation, manholes, overflows access points and scour valves.
3. Design storm water and foul water reticulation networks.
4. Ancillary works including anchors and ties, trust blocks, cathodic protection.
5. Calculate quantities and produce water reticulation network drawings

WATER TREATMENT TECHNOLOGY 3B (WTRM301) (12 Credits)

Theory: 3 periods per week

Semester Mark: Two tests – 20% each

Exit level outcome (ELO) assessed: - ELO 7 Impact of engineering activity.

Examination: One three-hour paper – 60%

SYLLABUS

1. Water quality standard in South Africa
2. Effluent criteria in South Africa
3. Stream pollution

4. DO sag curve
5. Oxygen demand, BOD,COD
6. Activated sludge
7. Oxidation process
8. Disinfection

WATER TREATMENT TECHNOLOGY IV MODULE 1 THEORY (WTTC411) (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 (WTTC421) (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.