

CIVIL ENGINEERING



DUT
DURBAN UNIVERSITY OF TECHNOLOGY
INYUVESI YASATHEKINNI YEZOBUCHHEPHESHI



**FACULTY OF
ENGINEERING
& THE BUILT
ENVIRONMENT**

20 HAND 24 BOOK

ENVISION2030

transparency • honesty • integrity • respect • accountability
fairness • professionalism • commitment • compassion • excellence

CREATIVE. DISTINCTIVE. IMPACTFUL.

HANDBOOK FOR 2024

FACULTY
OF
ENGINEERING
AND THE BUILT
ENVIRONMENT

DEPARTMENT OF
CIVIL AND
CONSTRUCTION
STUDIES
ENGINEERING

Pietermaritzburg

MISSION STATEMENT

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

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

VISION OF THE DEPARTMENT OF CIVIL ENGINEERING

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

What is a University of Technology?

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

QUALIFICATION PURPOSE

The purpose of the Diploma in Engineering Technology: Civil Engineering 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. To be leaders in the engineering sphere the function.

The purpose of the Diploma in the Built Environment in Construction Studies

For students to assimilate the necessary knowledge, understanding, abilities and skills required for further learning towards becoming a competent practicing construction manager or quantity surveyor. This combined with a period of post qualification mentored work experience will enable them to become competent practicing technician, able to apply judgment and work with minimal supervision and responsibly.

To provide students with a sound knowledge base which emphasizes general principles and application in a particular field or discipline, and the ability to apply their knowledge and skills to particular career or professional contexts, while equipping them to undertake more specialised and intensive learning. Programmes leading to this qualification tend to have a strong professional or career focus and holders of this qualification are normally prepared to enter a specific niche in the labour market.

To provide students:

- 1) with the preparation required for careers in construction management and/or quantity surveying,
- 2) the ability to contribute to the economy and national development, and
- 3) entry to NQF level 6 programs, e.g., bachelors' programs must be a completed Diploma

To contribute to the critical mass of construction industry professionals educated specifically for the world of work, and who also play a pivotal role in the infrastructure development of our country.

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IMPORTANT NOTICES

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

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.

CONTACT DETAILS

All departmental queries:

Office Administrator:

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031 373 3141

Location of Department:

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All academic administrative queries:

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Ms Neetha Singh

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031 373 2718

Location of Student Administration:

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Durban

Executive Dean:

Prof Fulufhelo James Nemavhola

Telephone No:

031 373 2720

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031 373 2724

Location of Executive Dean's office:

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STAFFING

Acting Head of Dept/Senior Lecturer	
Dr. Darlington Chinenye Ikegwuoha (Pr Eng)	PhD: Civil Engineering
Dr. Jacob Ikotun	PhD: Civil Engineering
Lecturer	
Mr. Shanley Hay (Pr Tech Eng)	MTech: Civil Engineering
Mr. Arvin Ramsunder Sarjoo (Pr Tech Eng)	MSc:(Project Management); MEng:(Transportation Eng.)
Ms. Mbali Ndlovu (Pr Sci Nat)	MSc: Geology
Mr. Oliver Allan Rowe	MSc: Land Information Management
Mr. Daryl David De Kock	MSc: Environmental and Development
Ms. Zesizwe Ngubane (Pr Sci Nat)	MSc: Geohydrology
Mr. Jacob Adedayo Adedeji	MTech: Civil Engineering
Mr. Nkosinathi Luvuno Jele	MSc: Geological sciences)
Mr. Shavendran Moonsamy	MSc: Civil Engineering
Junior Lecturer	
Mrs. Abongile Ongezwa Nakin	BTech: Civil Engineering
Senior Laboratory Technician	
Mr. Nkosinathi Emmanuel Hlalukane	BTech: Civil Engineering (Transportation)
Laboratory Technician	
Mr. Sibongiseni Ezra Nzama	BTech: Civil Engineering (Urban)
Ms Tsembile Maseko	BTech: Civil Engineering (Urban)
Mr. Elanga Obedi Tchakubuta	BTech: Civil Engineering (Urban)
Computer Laboratory Technician	
Mr. Mondli Lutyeku	BTech: Information Technology
Departmental Secretary	
Ms. Nonkululeko Sthabile Mkhize	BTech: Office Management and Technology
General Assistant/Lab attendant	
Mr. Samuel Mtshali	Grade 12

PROGRAMMES OFFERED BY THE DEPARTMENT

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

Qualification	SAQA NLRD Number
Diploma in Engineering Technology: Civil Engineering	99026
Diploma in the Built Environment in Construction Studies	112383
M. Eng	96827
Master of Built Environment	96844
D. Eng	96812

PROGRAMME INFORMATION AND RULES

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

MINIMUM ADMISSION REQUIREMENTS

DIPLOMA in ENGINEERING TECHNOLOGY: CIVIL ENGINEERING

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

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

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

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

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

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

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

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

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

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

No points are allocated for the subject “Life Orientation”

OR

National Technical Certificate (N4) with passes at 50% in four (4) relevant subjects including Engineering Mathematics and Engineering Science or an equivalent SAQA NQF Level 4 qualification, as well as compliance with the English language requirements as stated in the General rules.

For students who matriculate with NCV Level 4 Rating (FET)

A student must have obtained a 60% or higher pass in all of the following subjects;

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

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

MINIMUM ADMISSION REQUIREMENTS DIPLOMA in BUILT ENVIRONMENT: CONSTRUCTION STUDIES

This programme only has one intake per annum, which is usually in January.

In addition to the relevant General Rules pertaining to Registration (e.g., Rules G3, G4, G5, G6, G7, G8, G9 & G10); The minimum entry requirement is the National Senior Certificate or the National Certificate (Vocational) with appropriate subject 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, the minimum admission requirements, rule G7, is stipulated in the General Rules Handbook.

Further to the above, the following are required for admission into Diploma of the Built Environment (Construction Studies):

NSC, NCV, SC:

Compulsory Subjects	NSC	SC		NCV
	Rating (25 points)	HG	SG	
English home Language	4	50%	60%	English (70%)
English First Additional Language	4	60%	70%	
Mathematics (Not Maths Lit.)	4	50%	60%	70%
Physical Science	4	50%	60%	70%
Two more 20credit NSC subjects	4			
Two other relevant NCV vocational subjects				70 %

- **NOTE:** English Home Language, Mathematics and Physical Science are required at a minimum performance of level 4. English First Additional Language is required at a minimum performance of level 5.
- NSC Mathematical Literacy will not be accepted as a substitute for NSC Pure Mathematics.
- Applicants will be ranked according to the sum of subject NSC Mathematical and Physical Science marks to a minimum combination of 100%.
- Prospective applicants should present an NQF level 4 certificate in Construction in the Built Environment / Engineering for entry into the Diploma programme. The NSC certificate of the candidate must qualify the candidate for diploma study at an institution of higher learning.

Other:

Prospective students, that qualify for diploma study at an institution of higher learning, but do not meet the departmental mathematics and/or physics

requirements, may present the following N4 subjects, for consideration for entry to the Dip. (Construction Studies) programme.

- Mathematics and Engineering Science, plus:
- Building and Structural Construction
- Building and Structural Surveying
- English language as required above

The above are all to be passed, in the maximum of two sittings, with a minimum of 60%. Students will then be ranked, alongside the NSC students, according to the sum of their marks for N4.

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

EC2. GENERAL RULES

Except where otherwise stated 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 paid by his or her 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 all 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 using the appropriate form available from the Departmental reception. 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 (including GA's), will have to repeat that module.
- 4) Where a module year mark has a project or practical component, then the mark for such component cannot be carried over to a subsequent semester where the module is failed, unless so stipulated in the module specific rules.

EC6. CONDUCT OF STUDENT IN LABORATORY

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

EC7. SUPPLEMENTARY EXAMINATIONS

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

EC8. PROMOTION TO HIGHER LEVEL

Diploma in Engineering Technology: Civil Engineering

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:

- 1) for any second level module (i.e., NS2) when more than three modules from the standard first semester module combination are outstanding;
- 2) for any module of the standard third semester module combination (i.e. NS3) when more than three modules from the standard first and second semester module combination (i.e. NS1 & NS2) are outstanding.
- 3) for any module of the standard fourth semester module combination (i.e. NS4) when more than three modules from the standard first, second and third semester module combination (i.e. NS1, NS2 & NS3) are outstanding;
- 4) Furthermore, students who are repeating a module, will only be offered a place subject to the availability of space where laboratory or specialized 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 equivalent modules from the first semester level (i.e. the standard S1). Students who have already passed Drawing - Introduction to CAD (or equivalent) at another institution may be required to undergo and pass a proficiency test before they will be granted an exemption from the module or be permitted to register for any of the standard third or fourth semester modules. 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 for equivalent modules if prior disclosure of these modules has been made and the departmental HOD has given confirmation thereof in writing prior to registration.

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 stated in the rules for that instructional programme.

EC10. SPECIAL TESTS

The Head of Department may grant a special test to a student who has been prevented from taking a test:

by illness on the day of the test or immediately before it, provided that he/she submits a medical certificate on the prescribed form (available from the Departmental reception). It is required that a medical practitioner, registered by the Health Professions Council of SA, homoeopath or chiropractor, registered with the South African Associated Health Board, specifies the exact nature and duration of the illness and that for health reasons it was impossible or undesirable for the student to sit for the test. Such students should submit 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

by circumstances which in the opinion of the head of department were beyond his/her control at the time of the test provided that satisfactory evidence of such circumstances is provided. Such circumstances shall not include: any misinterpretation by him/her of the date, time or venue of the test, transportation difficulties, where his/her residential term time address is within the area serviced by a scheduled bus or commuter train service to the central Pietermaritzburg area, and provided otherwise that he/she informs the head of department of such difficulty prior to the time of commencement of the test, 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, either immediately on submitting the medical certificate, or alternatively, within the last two weeks of official lectures of each semester and in which case may be based on the entire semesters work. There will only be one special test set per semester, and should a student miss this test then they will not be afforded a further opportunity to write and will thus be awarded zero.

EC11. REFUSAL OF RE-REGISTRATION

- 1) A student who fails any module for the first time shall be placed on an academic warning and may be allowed to re-register with special conditions.
- 2) 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 Committee.
- 3) A student who has been refused permission to re-register for a module in terms of Rule 11.2 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/subjects are attended and passed at another institution and exemptions granted in accordance with the General Rules.
- 4) A student who has not completed the Diploma in Engineering Technology: Civil Engineering within three years of the first registration, may be refused permission to register, or, at the discretion of the Departmental Appeal Committee, may be accepted subject to special conditions.
- 5) A student wishing to appeal to the Faculty Board of Engineering and the Built Environment against the application of this rule must submit an on-line appeal via the student portal in which he/she explains the reasons for his/her appeal. This on-line appeal must be submitted within five (5) University working days of being officially notified in writing that he/she has not been permitted to re-register. No on-line appeals will be considered after this.
- 6) Where a student has appealed against exclusion in terms of these rules or rule G17, and such appeal has been refused, then said student may not submit a further appeal until the conditions of the refused appeal have been fully met.

EC13. LATE REGISTRATION

- 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. Students who have not registered within this period will only be permitted to register on the approval of the HoD or Dean.
- 2) No student will be permitted to add or delete any module later than one week after the commencement of full-time semester lectures, except where the result of a supplementary examination has delayed such change or addition, or as a result of an administrative error by the University.
- 3) Where a student is unable to register by the published departmental late

registration date referred to in 13.1, for reasons deemed acceptable to the HOD, then such student will only be permitted to register if they have obtained and had approved, an Application for Late Registration form, by the published late registration closing date.

EC14. TIMETABLE CLASH

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 for that component of the work missed.

EC15. STUDENT DRESS

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

EC16. ACCESS TO DEPARTMENTAL COMPUTER LABORATORIES

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

- 1) the module lecturer or an approved departmental tutor is present;
- or
- 2) the Departmental Computer Technician is present.

EC17. COMPETENCY MODULES

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

EC19. ACADEMIC INTEGRITY

The Department expects students to adhere to a strict code of ethics, and the following principles regarding academic integrity apply;

- **Know your rights** – do not allow other students in your class to diminish the value of your achievement by taking unfair advantage. Report any

academic dishonesty to the HOD.

- **Acknowledge your sources** – whenever you use words or ideas that are not your own when writing a paper or assignment, use quotation marks where appropriate and cite your source in a footnote, and back it up at the end with a list of references consulted.
- **Protect your work** – in examinations, do not allow your neighbours to see what you have written, you are the only one who should receive credit for what you know.
- **Avoid suspicion** – do not put yourself in a position where you can be suspected of having copied another person's work or having used unauthorised notes in an examination. Even the appearance of dishonesty may undermine your lecturer's confidence in your work.
- **Do your own work** - the purpose of assignments is to develop your skills and measure your progress. Letting someone else do your work defeats the purpose of your education and may lead to serious charges against you.
- **Never falsify** a record or permit another person to do so - academic records are regularly audited and students whose results have been altered put their entire academic record at risk.
- **Never fabricate** data, citations, or experimental results - many professional careers have ended in disgrace, even years after the fabrication first took place.
- **Always tell the truth** when discussing your work with your instructor - any attempt to deceive may destroy the relation of teacher and student.

EC20. REQUIREMENT TO PASS THE GRADUATE ATTRIBUTES (GA)

In modules where GAs are assessed, the student must achieve a final minimum pass mark of 50% (or higher if so stipulated) in that module as well as being deemed competent in achieving the GA requirements, as specified in the relevant study guide, in order to pass that module, and therefore graduate.

EC21. TEST/EXAMINATION VENUE RULES

In addition to the requirements of the General Rule G13 (1) (p), No student shall be permitted to have ANY cell phone, smart watch or mobile electronic device in a departmental test or examination venue. Calculators required as stipulated on the question paper are permitted.

Lockers have been provided within the Civil Engineering Building to enable a student to safely secure their phone/s mobile electronic device prior to entering the test/examination venue.

Where a student is found to have in their possession ANY cell phone mobile electronic device, then such device shall be confiscated, the student will be instructed to leave the test/examination venue, and where appropriate disciplinary charges will be laid.

PROGRAMME STRUCTURE

I. DIPLOMA in ENGINEERING TECHNOLOGY: CIVIL ENGINEERING (DICVEI)

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

Name of module	ModuleCode*	Sem	NQF Level	Module Credits	C/ F	Pre-Req.	Exam **
Computer Applications A	CMAA101	1	5	12	C	Nil	No
Computer Applications B	CMAB101	1	5		C	Nil	No
Cornerstone 101	CSTN101	1	5	12	C	Nil	No
Drawing Applications	DRAP101	1	5	8	C	Nil	No
Intro to Construction Materials	ICMT101	1	5	8	C	Nil	No
Law for life	LWLF101	1	5	8	C	Nil	No
Mathematics A	MMTA101	1	5	12	C	Nil	No
Physics A	PSCA101	1	5	8	C	Nil	Yes
Civil Engineering methods	CEMT101	2	5	12	C	Nil	No
Civil Mechanics I	CIVM101	2	5	8	C	Nil	Yes
Drawing (intro to CAD)	DICD101	2	5	8	C	CMAA101 DRAP101	No
Mathematics B	MMTB101	2	5	12	C	MMTA101	No
Physics B	PSCB101	2	5	8	C	Nil	Yes
Surveying for Civil Engineering	SVCE201	2	6	12	C	Nil	No
Technical Literacy	TLIT101	2	5	8	C	Nil	No
Contract Management	CNTM201	3	6	8	C	TLIT101	Yes
Intro to Water Engineering A	IWEA201	3	6	12	C	Nil	Yes
Mathematics C	MMTC101	3	5	12	C	MMTB101	No
Physics C	PSCC101	3	5	8	C	Nil	Yes
Soil Mechanics A	SLMA201	3	6	8	C	ICMT101	No
Structural Mechanics	STME201	3	6	8	C	CIVM101 PSCA101 PSCB101	Yes
Transport Technology A	TRNA201	3	6	12	C	DICD101	Yes
Contract Administration	CTAD201	4	6	8	C	CNTM201	Yes
Design Project	DSGP201	4	6	12	C	CNTM201 IWEA201 MMTC101 PSCC101 SLMA201 STRA201 TRNA201	No
Intro to Structural Design	INSD201	4	6	8	C	PSCC101 STME201	No
Intro to Water Engineering B	IWEB201	4	6	8	C	IWEA201	Yes
Soil Mechanics B	SLMB201	4	6	8	C	SLMA201	Yes
Structural Analysis	STRA201	4	6	12	C	STME201	Yes
Structural Detailing	STDT201	4	6	8	C	DICD101	No
Transport Technology B	TRNB201	4	6	12	C	TRNA201	Yes

Note: A student who registers for Design Project (DSGP201) will have a choice of three specialist design fields, but may only select the design field provided that, they are concurrently registered for or have previously passed the modules indicated below;

Specialist Area	Co-requisite Modules
Structural Engineering	CTAD201,SLMB201 & STRA201
Transportation Engineering	CTAD201, SLMB201 & TRNB201
Water Engineering	CTAD201, IWEB201 & SLMB201

In addition, where a student elects the Structural option, they must already have passed INSD201 and STDT201.

1.1 GRADUATE ATTRIBUTES

Engineering students completing this qualification will demonstrate competence in the Graduate Attributes indicated below:

- **Graduate Attribute 1: Problem solving:**
Students will be required to apply engineering principles to systematically diagnose and solve well-defined engineering problems in subjects at all levels.
- **Graduate Attribute 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 well-defined engineering problems.
- **Graduate Attribute 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 increased in complexity through the levels. In the Civil Design Project, the preliminary part of the design will be carried out in phase I, while phase II will see to the project completion. The project will include one or more of the following impacts: social, economic, legal, health, safety, and environmental. Civil Design Project is therefore one large project.
- **Graduate Attribute 4: Investigation:**
Students will conduct investigations of well-defined problems through locating, searching and selecting relevant data from codes, database and literature, designing and conducting experiments, analysing and interpreting results to provide valid conclusions.

- Graduate Attribute 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 well-defined engineering problems, with an understanding of the limitations, restrictions, premises, assumptions and constraints will be embedded in all subjects.
- Graduate Attribute 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.
- Graduate Attribute 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 subject of Environmental Engineering.
- Graduate Attribute 8: Individual and teamwork:**
Knowledge and understanding of engineering management principles will be specifically covered in the Subject of Entrepreneurship Skills. Individual and teamwork competency will be addressed in other subjects as well. The ability to manage a project will be demonstrated in the subject Design Project.
- Graduate Attribute 9: Independent learning:**
Engage in independent and life-long learning through well-developed learning skills. Range Statement: The learning context is varying and unfamiliar. Some information is drawn from the technological literature.
- Graduate Attribute 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.

The Graduate Attributes (GA's) are developed throughout the qualification and are cross-referenced to the ECSA GAs which are outlined above. In order to measure the effectiveness of this development, assessment is undertaken in some of the exit level modules (those marked X) and highlighted in green are the modules in the table below.

1.1 Graduate Attributes Table:

Name of module	Module Code*	ECSA Graduate Attribute (GA)									
		1	2	3	4	5	6	7	8	9	10
Computer Applications A	CMAA101										
Computer Applications B	CMAB101										
Cornerstone 101	CSTN101										
Drawing Applications	DRAP101										
Intro to Construction Materials	ICMT101										
Law for life	LWLF101										
Mathematics A	MMTA101										
Physics A	PSCA101										
Civil Engineering Methods	CEMT101										
Civil Mechanics I	CIVM101										
Drawing (intro to CAD)	DICD101										
Mathematics B	MMTB101										
Physics B	PSCB101										
Surveying for Civil Engineering	SVCE201										
Technical Literacy	TLIT101										
Contract Management	CNTM201										X
Intro to Water Engineering A	IWEA201										
Mathematics C	MMTC101										
Physics C	PSCC101										
Soil Mechanics A	SLMA201										
Structural Mechanics	STME201										
Transport Technology A	TRNA201										
Contract Administration	CTAD201								X		
Design Project	DSGP201	X		X			X	X			
Intro to Structural Design	INSD201					X					
Intro to Water Engineering B	IWEB201										
Soil Mechanics B	SLMB201				X						
Structural Analysis	STRA201		X								

Structural Detailing	STDT201									X	
Transport Technology B	TRNB201										

2. DIPLOMA in THE BUILT ENVIRONMENT IN CONSTRUCTION STUDIES (DIBESI)

The instructional programme shall have a minimum duration of four (4) semesters of full-time study and shall consist of the modules listed below. Please note that not all the modules for each semester are available every semester.

Name of module	Module Code*	Sem	NQF Level	Module Credits	C / F	Pre-Req.	Exam**
Construction Methods IA	CMDS101	1	5	8	C	Nil	No
Construction Organisation IA	CORG101	1	5	8	C	Nil	No
Cornerstone	CSTN101	1	5	12	C	Nil	No
Information & Communication & Literacy & Skill	ICTL101	1	5	8	C	Nil	No
Mathematics (Built Environment) IA	MFBE101	1	5	12	C	Nil	No
Physics (Built Environment) IA	PFBE101	1	5	12	C	Nil	No
Quantity Surveying IA	QUSU101	1	5	8	C	Nil	No
Construction Management IB	CMNA101	2	5	8	C	Nil	No
Construction Technology IB	CTCE101	2	5	8	C	Nil	No
Interpretation of Documentation IB	INDO101	2	5	8	C	Nil	No
Materials IB	MTRS101	2	5	12	C	Nil	No
Quantities & Documentation IB	QUDO101	2	5	8	C	Nil	No
Mathematics for the built environment IB	MFBE102	2	5	12	C	MFBE101	No
Technical Literacy IB	TLIT101	2	5	8	C	Nil	No
Construction Management 2A	CMNA201	3	6	8	C	CORG101 CNMA101	No
Construction Technology 2A	COTEC202	3	6	8	C	CMDS101 CTEC101 MTRS101	No
Health & Safety 2A	HEAS201	3	5	8	C	Nil	No
Introduction to Price Analysis 2A	INPA201	3	5	8	C	Nil	No
Labour Relations 2A	LARE201	3	6	8	C	Nil	No
Mechanics (Built Environment) 2A	MFBE201	3	6	12	C	Nil	No
Quantities & Documentation 2A	QUDO201	3	6	8	C	INDO101 QUSU101 QUDO101	No
Site Surveying 2A	SSRV201	3	6	8	C	Nil	No
Capstone Project 2B	CPRO201	4	6	20	C	Nil	No
Construction Management 2B	CMNA201	4	6	8	C	Nil	No
Construction Technology 2B	COTEC201	4	6	8	C	Nil	No
Entrepreneurship 2B	ENPR201	4	6	8	C	Nil	No
Environmental Management 2B	ENVM202	4	6	8	C	Nil	No

MASTER OF ENGINEERING ENTRANCE REQUIREMENTS

Every candidate for this qualification shall have:
completed the requirements for the BEng Hons or equivalent;

Or

have completed a post graduate Diploma in Civil Engineering Technology,

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

(Amended wef 2015/08)

MASTER OF THE BUILT ENVIRONMENT ENTRANCE REQUIREMENTS

Every candidate for this qualification shall have:
completed the requirements for the BEng Hons in 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 modules related to the specific field of study. Students are required to undertake research under the guidance of a supervisor.

(Amended wef 2015/08)

DOCTOR OF ENGINEERING ENTRANCE REQUIREMENTS

Every candidate for this qualification shall have:
completed the requirements for the MEng 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 modules related to the specific field of study. Students are required to undertake research under the guidance of a supervisor. (Amended wef 2015/08)

ASSESSMENT RULES

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

See also General Rules G12 to G16

RE-REGISTRATION RULES

See Rule EC11

INDICATIVE CONTENT NOTE:

Except where otherwise stated all modules have a required sub-minimum of 40% of the overall semester mark and 40% of the examination mark respectively.

The allocation of periods for each module is based on a contact time of 50 minutes with classes commencing at 60 minutes intervals.

CIVIL ENGINEERING METHODS (CEMT101)

Theory: 3 periods per week

Semester Mark: One Test: - 30%

One Test: - 30% (subminimum of 50%)

Control Test: - 40%

No Examinations; 100% course mark

SYLLABUS

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

CIVIL MECHANICS I (CIVM101) (80703)

Theory: 2 periods per week

Tutorial: 2 periods per week

Practical: 1 period per week

Semester Mark: Two Tests: - 15% each

Two Practicals - 5% each (subminimum of 50% on each)

Control Test: - 60% (subminimum of 40%)

No examination; 100% course mark

SYLLABUS

1. Forces and Loads
2. Moment Equilibrium
3. Support Types/Reactions
4. Triangulated pin-jointed Frames and Trusses

COMPUTER APPLICATIONS A (CMAA101) (60101)

Theory: 2 periods per week
 Tutorial: 1 period per week
 Semester Mark: Four Practical Tests:
 Computer Utilization - 10%
 Operating Systems - 15%
 Spreadsheets & - 40%
 Word Processing
 Control Test: - 60% (subminimum of 40%)
 No examination; 100% course mark

SYLLABUS

1. Computer Utilisation and Hardware
2. Operating Systems – Windows
3. Word Processing
4. Spreadsheets

COMPUTER APPLICATIONS B (CMAB101) (60101)

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

CONTRACT ADMINISTRATION (CTAD201)

Theory: 3 periods per week
 Tutorial: 1 period per week
 Practical: 1 period per week
 Semester Mark: Two Tests: - 10% each
 Two Assignment: - 20% (assessing GA8 at the exit level subminimum of 50%)

Control Test: - 60% (subminimum of 40%)
No examination; 100% course mark

SYLLABUS

1. Measurement of Civil Engineering Works
2. Bills of Quantities
3. Specifications
4. Estimating and Tendering
5. General Conditions of Contract (latest edition)
6. Software Applications

CONTRACT MANAGEMENT (CNTM201)

Theory: 3 periods per week
Tutorial: 1 period per week
Practical: 1 period per week
Semester Mark: Two Test: - 10% each
Assignment: - 20% (assessing GA10 at the exit level
subminimum of 50%)
Control Test: - 60% (subminimum of 40%)
No examination; 100% course mark

SYLLABUS

1. Contract Administration
2. Planning Techniques
3. Financial Planning
4. Labour and Safety Legislation

CORNERSTONE 101 (CSTN101)

Theory: 2 periods per week
Tutorial: 2 period per week
Semester Mark: Weekly Tasks - 10%
Tutorial Attendance - 10%
Two Assignments - 40% each
No examination; 100% course mark

SYLLABUS

The module content will be developed around the concept of journeys, across time, across space, and across human relationships. The module will bring different disciplinary perspectives to this content – environmental, historical and sociological in particular.

DESIGN PROJECT (DSGP201)

Theory:	2 periods per week	these would be consultation sessions
Practical:	2 periods per week	
Semester Mark:	One Industry based Project	- 100% (assessing GA1, GA3, GA6, & GA7, at the exit level, subminimum 50%)
	Preliminary Design Phase (GA1)	- 30% (subminimum of 50% based on report)
	Detailed Design Phase (GA3 and GA7)	- 50% (subminimum of 50% based on report)
	Oral Presentation (GA6)	- 20% (subminimum of 50% based on report)
		No Examination; 100% course mark

SYLLABUS

The student will be required to identify a discipline specific industry project which they will then undertake a detailed design of, sourcing the necessary materials, specifications, and technology applications to complete the project, guided by discipline specialist staff.

DRAWING APPLICATIONS (DRAP101)

Theory:	3 periods per week	
Tutorial:	2 period per week	
Semester Mark:	Three Assignments	- 12% each
	One Test	- 24%
	Control Test:	- 40% (subminimum of 50%)
		No examination; 100% course mark

SYLLABUS

- | | |
|--|-------------------------------|
| 1. Drawing Standards as per SANS latest code | 5. Isometric Drawings |
| 2. Basic Instrument Drawing Skills | 6. Orthographic Drawings |
| 3. Using Scales | 7. House Plans |
| 4. Dimensioning Standards | 8. Basic Road Design Drawings |

DRAWING (INTRODUCTION TO CAD) (DICD101)

Theory:	3 periods per week	
Tutorial:	1 period per week	
Semester Mark:	One Test	- 20%
	One Test	- 20% (subminimum of 50%)
	Control Test:	- 60% (subminimum of 60%)
		No examination; 100% course mark

SYLLABUS

1. Basic CAD operation

2. Basic Architectural Drawings
3. Basic Reinforced Concrete Element Drawings
4. Basic Road and Construction Detail Drawings

INTRODUCTION TO CONSTRUCTION MATERIALS (ICMT101)

Theory: 2 periods per week
 Tutorial: 1 period per week
 Practical: 2 periods per week
 Semester Mark: Two Tests: - 20% each
 One Control Test: - 50% each (50% subminimum)
 Two Practicals: - 5% each (40% subminimum)
 No examination; 100% course mark

INTRODUCTION TO STRUCTURAL DESIGN (INSD201)

Theory: 2 periods per week
 Tutorial: 2 periods per week
 Practical: 2 periods per week
 Semester Mark: Two Tests: - 15% each
 One Control Test: - 40% each (40% subminimum)
 Three Practicals: - 10% each (50% subminimum total)
 No examination, 100% course work

SYLLABUS

1. Loading, Analysis and Design of determinate structures
2. Introduction to the design of steel sections and members
3. Introduction to the design of concrete sections and members
4. Structural Design software applications

INTRODUCTION TO WATER ENGINEERING A (IWEA201)

Theory: 3 periods per week
 Tutorial: 1 period per week
 Practical: 2 periods per week
 Semester Mark: Two Tests: - 12% each
 Four Practicals - 2% (subminimum of 40% on total)
 One Assignment: - 8% (subminimum of 50%)
 Control Test: - 60% (subminimum of 40% on total)
 No examination; 100% course mark

SYLLABUS

1. Properties of Fluids
2. Static pressure and head
3. Buoyancy and flotation
4. Liquids in motion
5. Momentum and fluid flow
6. Forces on reducers and bends
7. Weirs, flumes and notches
8. Losses of energy in pipelines
9. Pipelines
10. Open channel flow, energy and hydraulic jump.
11. Potable water distribution, pumping and storage.
12. Sewage reticulation
13. Water software applications

INTRODUCTION TO WATER ENGINEERING B (IWEB201)

Theory: 2 periods per week
Tutorial: 2 period per week
Semester Mark: Two Tests: 20% each
Control Test: 60 %
No examination; 100% course mark

SYLLABUS

1. Introduction to Public Health
2. Overview of wastewater collection
3. Overview of the characterisation of waters and waste waters including environmental pollution.
4. Introduction to treatment processes
5. Physical treatment processes
6. Chemical treatment processes
7. Biological treatment processes
8. Sludge treatment and disposal
9. Water treatment
10. Wastewater treatment
11. Introduction to Hydrology
12. Flood Determination

LAW FOR LIFE (LWLF101)

Theory: 1 period per week
Tutorial: 1 period per week
Semester Mark: Three Assignment: - 33,33 each
No examination; 100% course mark

SYLLABUS

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

MATHEMATICS A (MMTA101)

Theory: 3 periods per week

Tutorial: 2 periods per week

Semester Mark: Three Tests (best of two): - 10% each

Two Control Tests: - 40% each

No examination; 100% course mark

SYLLABUS

1. Numbers and Algebra
2. Areas and Volumes
3. Trigonometry
4. Graphs and Functions
5. Complex Numbers
6. Series: Maclaurin Series

MATHEMATICS B (MMTB101)

Theory: 3 periods per week

Tutorial: 2 periods per week

Semester Mark: Three Tests (best of two): - 10% each

Two Control Tests: - 40% each

No examination; 100% course mark

SYLLABUS

1. Calculus - Differentiation
2. Calculus - Integration
3. Linear Algebra
4. Statistics and Probability

MATHEMATICS C (MMTC101)

Theory: 3 periods per week

Tutorial: 2 periods per week

Semester Mark: Three Tests (best of two): - 10% each

Two Control Tests: - 40% each

No examination; 100% course mark

SYLLABUS

1. Advanced Calculus - Differentiation

2. Advanced Calculus - Integration
3. Differential Equations

Note:

A full-time student who obtained a FINAL RESULT of between 45% and 49% for any Mathematics Module 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 these results in the student passing, a final result of 50% will be allocated.

PHYSICS A (PSCA101)

Theory:	2 periods per week	
Tutorial:	1 period per week	
Practical:	2 periods per week	
Semester Mark:	Test One:	- 35%
	Test Two:	- 35%
	Practical Tests:	- 30%
		No examination; 100% course mark

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
8. Periodic Motion

PHYSICS B (PSCB101)

Theory:	2 periods per week	
Tutorial:	1 period per week	
Practical:	2 periods per week	
Semester Mark:	Test One:	- 35%
	Test Two:	- 35%
	Practical Tests:	- 30%
		- No examination; 100% course mark

SYLLABUS

- | | |
|---------------------|--|
| 1. Thermodynamics | 4. Acoustic Phenomena |
| 2. Mechanical Waves | 5. Coulomb's Law |
| 3. Vibrating Bodies | 6. Current, Resistance and Capacitance |

PHYSICS C (PSCCI01)

Theory: 2 periods per week

Tutorial: 1 period per week

Practical: 2 periods per week

Semester Mark: Test One: - 35%

Test Two: - 35%

Practical Tests: - 30%

- No examination; 100% course mark

SYLLABUS

1. The Magnetic Field
2. Inductance
3. Maxwell's Equations
4. Electromagnetic Waves
5. The Nature and Propagation of Light
6. Atomic and Molecular Structure

SOIL MECHANICS A (SLMA201)

Theory: 2 periods per week

Tutorial: 1 period per week

Practical: 2 periods per week

Semester Mark: Two Tests: - 15% each

Practical: - 10% (subminimum of 50%)

Control Test: - 60% (subminimum of 40%)

No examination; 100% course mark

SYLLABUS

1. Geology
2. Soil Mechanics
3. Geology Practicals

SOIL MECHANICS B (SLMB201)

Theory: 2 periods per week

Tutorial: 2 periods per week

Practical: 2 periods per week

Semester Mark: Two Tests: - 12% each

Practicals: - 2%

One Practical: - 4% (subminimum of 40% on combined practicals)

Two Assignments: - 4% each (subminimum of 50%)

Control Test: - 60% (subminimum of 40%)

No examination; 100% course mark

SYLLABUS

- | | |
|---|---|
| 1. Permeability | 6. Shallow foundations and bearing capacity |
| 2. Stresses in soils | 7. Site investigation |
| 3. Compressibility and consolidation of soils | 8. Laboratory practicals |
| 4. Shear strength of soils | 9. Software applications |
| 5. Stability of slopes | |

STRUCTURAL ANALYSIS (STRA201)

Theory: 3 periods per week

Tutorial: 1 period per week

Practical: 2 periods per week

Semester Mark: Two Tests: - 12% each
 Practicals: - 8% (subminimum of 40%)
 Assignments - 8% (subminimum of 40%)
 Control Test: - 60% (subminimum of 40%)
 No examination; 100% course mark

SYLLABUS

1. Historical background of structural analysis.
2. Stability of statically indeterminate structures.
3. Analysis of statically determinate trusses: Methods of joint, sectioning and tension coefficient.
4. Deflection in statically determinate structures: Double integration; moment-area; virtual work and strain energy methods.
5. Introduction to indeterminate structures: Three-moment Equation or moment distribution method
6. Software application to analyse determinate structures.

STRUCTURAL DETAILING (STDT201)

Theory: 2 periods per week

Tutorial: 2 periods per week

Practical: 1 period per week

Semester Mark: Two Tests: - 20% each
 One Assignment (GA - 10% (subminimum of 50%)
 9):
 Control Test: - 50% (subminimum of 50%)
 No examination; 100% course mark

SYLLABUS

1. Fundamental concept of structural detailing
2. Detailing procedure
3. Detailing of concrete structures - reinforcement
4. Detailing of steel structures
5. Software applications

STRUCTURAL MECHANICS (STME201)

Theory: 3 periods per week

Tutorial: 2 periods per week

Practical: 2 periods per week

Semester Mark: Two Tests: - 12% each
Practical: - 8% (subminimum of 40%)
One Assignment: - 8% (subminimum of 50%)
Control Test: - 60% (subminimum of 40%)
No examination; 100% course mark

SYLLABUS

1. Shear force and bending moments of beams
2. Direct stress and strain in structures
3. Engineering section properties
4. Bending, shear and combined stresses
5. Stability of columns
6. Analysis of retaining wall
7. Software applications

SURVEYING FOR CIVIL ENGINEERING (SVCE201)

Theory: 3 periods per week

Tutorial: 2 periods per week

Practical: 3 periods per week

Semester Mark: Two Tests: - 10% each
One Practical: - 15% (subminimum of 50%)
One Practical: - 15% (subminimum of 50%)
- 10% (subminimum of 70%)
Competency Test
Control Test: - 40% (subminimum of 40%)
No examination; 100% course mark

SYLLABUS

1. Basic principles of surveying
2. Map projections and survey calculations
3. Horizontal control
4. Vertical control
5. Topographical surveying
6. Horizontal and vertical alignment introduction
7. Setting out of engineering works
8. Areas and volumes
9. Surveying computer applications

TECHNICAL LITERACY (TLIT101)

Theory: 2 periods per week

Tutorial: 2 period per week

Semester Mark: Two Tests: - 30% each
One Assignment: - 40% (with a subminimum of 50%)
No examination; 100% course mark

SYLLABUS

1. Written Communication
2. Visual Communication
3. Oral Communication
4. Communication Theory
5. Small Group Communication and Problem Solving

TRANSPORT TECHNOLOGY A (TRNA201)

Theory: 3 periods per week

Tutorial: 2 periods per week

Practical: 1 period per week

Semester Mark: Two Tests: - 10% each
One Computer Assignment: - 20% (subminimum of 50% assessing GA3)
Control Test: - 60% (subminimum of 40%)
No examination; 100% course mark

SYLLABUS

1. Traffic Engineering
2. Route Location
3. Basic Design Criteria
4. Horizontal Alignment
5. Vertical Alignment
6. Access Design
7. Drainage Design
8. Earthworks Design

TRANSPORT TECHNOLOGY B (TRNB201)

Theory: 3 periods per week

Tutorial: 1 period per week

Practical: 2 periods per week

Semester Mark: Two Tests: - 10% each
Five Practicals: - 2% (subminimum of 40% on total)
One Computer Assignment: - 10% (subminimum of 50%)

Control Test: - 60% (subminimum of 40%)
No examination; 100% course mark

SYLLABUS

1. Material Specifications and Tests
2. Pavement Design
3. Seal Design
4. Pavement Rehabilitation

CAPSTONE PROJECT 2B (CPRO201)

Theory: 2 periods per week

Tutorial: 1 period per week

Independent learning: 2 periods per week

learning

Semester Mark: Abstract: - 15% (with 50% subminimum)
Feasibility report: - 15% (with 50% subminimum)
Proposal: - 15% (with 40% subminimum)
Presentation - 15% (with 50% subminimum)
Draft Report - 15% (with 50% subminimum)
Final Report - 25% (with 50% subminimum)

SYLLABUS

The project assignment should contain elements which are innovative, experimental or exploratory in nature. The student will be responsible for securing an industry sponsor with expertise in the project area and an academic mentor from professional graduates or academic staff. Evidence must be presented regarding the involvement of each mentor.

1. Project Reports

Primarily intended for the preparation of the final report for the Industry Sponsored Project, this course will provide the basis and format for all technical reports required in the programme. Emphasis will be placed on the overall structure, organization of information and the logical progression of concepts.

2. Technical Presentations

The ability to make an effective business presentation is more essential than ever for individuals wanting to advance in their careers. This course will describe to participants how to analyse audience needs and then integrate a variety of presentation techniques to deliver an effective presentation. It is expected that the mentors will be invited to the presentation.

3. Project Proposals

This course will help the student conduct the necessary literature review to define clearly the industry sponsor/research/investigation topic, and to prepare an effective proposal for submission to the department. The industry sponsor is

expected to provide occasional guidance and support relating to this activity.

4. Industry Based Project

In conjunction with an industry sponsor, the student solves a technical problem relating to construction. The research/investigation project must contain some elements that are innovative, experimental, or exploratory in nature. An industry mentor and an academic mentor will supervise the progress of the project, provide guidance and direction where appropriate, and evaluate the final report and its presentation.

CONSTRUCTION MANAGEMENT 1B (CMNA101)

Theory: 2 periods per week

Tutorial: N/A

Practical: N/A

Semester Mark: One Tests: - 20% (with 50% subminimum)
Assignment 1: - 20% (with 50% subminimum)
Control Test: - 60% (with 40% subminimum)

SYLLABUS

1. Procurement in the Construction Industry
2. Notice to bidder
3. Role of various parties involved in the preparation of tenders
4. Pretender planning stage
5. Documentation for pretender planning
6. Planning techniques
7. Introduction to MS Projects

CONSTRUCTION MANAGEMENT 2A (CMNA201)

Theory: 2 periods per week

Tutorial: N/A

Practical: N/A

Semester Mark: One Tests: - 20% (with 50% subminimum)
Assignment 1: - 20% (with 50% subminimum)
Control Test: - 60% (with 40% subminimum)

SYLLABUS

1. The composition, role players, processes and role of construction industry.
 - Role of construction industry
 - Role players and their duties
 - Impact of legislation, regulations and codes
 - Major construction activities
 - Communication techniques

2. Site administration and cost control

CONSTRUCTION MANAGEMENT 2B (CMNA202)

Theory: 2 periods per week

Semester Mark: One Tests: - 20% (with 50% subminimum)
Assignment 1: - 20% (with 50% subminimum)
Control Test: - 60% (with 40% subminimum)

SYLLABUS

1. Theory and principles.
 - Theory underpinning the principles of financial management in society
 - Theory underpinning the principles of marketing management in society
 - Theory underpinning the principles of production management in society
2. Systems Theory

CONSTRUCTION METHODS 1A (CMD5101)

Theory: 2 periods per week

Semester Mark: One Tests: - 20% (with 50% subminimum)
Assignment 1: - 20% (with 50% subminimum)
Control Test: - 60% (with 40% subminimum)

SYLLABUS

1. Traditional building method
2. Frame structures
3. Industrial building system
4. Prefabricated materials
5. Steel structures

CONSTRUCTION ORGANISATION 1A (CORGI01)

Theory: 2 periods per week

Tutorial: N/A

Practical: N/A

Semester Mark: One Tests: - 20% (with 50% subminimum)
Assignment 1: - 20% (with 50% subminimum)
Control Test: - 60% (with 40% subminimum)

SYLLABUS

1. History of Construction Management
2. Organisational structure
3. Organisations involved in the Building Industry
4. Parties involved in the Construction Process
5. Duties and responsibilities of professional and Building or Construction Industry
6. Leadership

CONSTRUCTION ORGANISATION 1A (CORGI01)

Theory:	2 periods per week
Tutorial:	N/A
Practical:	N/A
Semester Mark:	One Tests: - 20% (with 50% subminimum)
	Assignment 1: - 20% (with 50% subminimum)
	Control Test: - 60% (with 40% subminimum)

SYLLABUS

1. Theory underpinning the principles of financial management in society
2. Theory underpinning the principles of marketing management in society
3. Theory underpinning the principles of production management in society
4. Systems theory

CONSTRUCTION TECHNOLOGY 1B (CTEC101)

Theory:	2 periods per week
Tutorial:	N/A
Practical:	N/A
Semester Mark:	One Tests: - 20% (with 50% subminimum)
	Assignment 1: - 20% (with 50% subminimum)
	Control Test: - 60% (with 40% subminimum)

SYLLABUS

5. Interpretation of construction drawings
6. Substructure and setting out
7. Filling on floors, dpm (damp proof membrane, dpc (damp proof course) and electrical conduits
8. Brick openings, lintels and arches
9. Doors and types of door frames
10. Setting up and building in doors frames

CONSTRUCTION TECHNOLOGY 2A (COTEC202)

Theory:	2 periods per week	
Tutorial:	N/A	
Practical:	N/A	
Semester Mark:	One Tests:	- 20% (with 50% subminimum)
	Assignment 1:	- 20% (with 50% subminimum)
	Control Test:	- 60% (with 40% subminimum)

SYLLABUS

1. Timber, steel and aluminum windows
2. Setting up and building windows
3. Roofs
4. Staircases

CONSTRUCTION TECHNOLOGY 2B (COTEC201)

Theory:	2 periods per week	
Tutorial:	N/A	
Practical:	N/A	
Semester Mark:	One Tests:	- 20% (with 50% subminimum)
	Assignment 1:	- 20% (with 50% subminimum)
	Control Test:	- 60% (with 40% subminimum)

SYLLABUS

1. Suspended slabs, formwork, and reinforcement
 2. Propping and structuring of concrete
 3. Finishes to wall, floors, and ceilings
 4. Ironmongery, glazing and mirrors
- Plumbing, sanitary fittings, waste, and soil pipework.

CORNERSTONE 101 (CSTN101)

Theory:	2 periods per week	
Tutorial:	2 period per week	
Semester Mark:	Weekly Tasks	- 10%
	Tutorial Attendance	- 10%
	Two Assignments	- 40% each
	No examination; 100% course mark	

SYLLABUS

The module content will be developed around the concept of journeys, across time, across space, and across human relationships. The module will bring different disciplinary perspectives to this content – environmental, historical and sociological in particular.

ENTREPRENEURSHIP 101 (ENPR201)

Theory:	2 periods per week	
Tutorial:	1 period per week	
Semester Mark:	Test 1	- 10%
	Test 2	- 10%
	Assignments	- 20%
	Control Test	- 60%

SYLLABUS

1. Impact of recent legislation on business - response to demands for redress and equity. Human resource function. Professionalism and ethics. Creative thinking Devise strategies to enable a business to respond to the challenges of the macro business environment.

2. Corporate social responsibility. Human Rights, Inclusivity and Environmental issues Team performance assessment and Conflict management Business Sectors and their environments Management and Leadership Quality of Performance within business functions

3. Investment: Securities; Investment: Insurance Forms of ownership and their impact on the business operation; Presentation of information and data response

ENVIRONMENTAL MANAGEMENT (ENVM202)

Theory:	2 periods per week	
Tutorial:	1 period per week	
Semester Mark:	Test 1	- 15%
	Test 2	- 15%
	Assignments	- 10%
	Control Test	- 60%

SYLLABUS

1. Introduction to environmental management

2. Social-environmental perspective

3. Environmental science perspective

4. Symbiotic relationship between both perspectives

5. Principles of effective environmental management

6. Environmental impact assessments

7. Environmental policies

8. Alternative construction processes to reduce impact on environment

9. Alternative material processes to reduce impact on environment

10. **Legislative** framework of construction control function in South Africa including implementation and enforcement

11. Major **Statutes** controlling building work including National Environmental Management: Protected Areas Act, 2003 (Act no. 57 of 2003), National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004), and National Environmental Management Act (107/1998): Environmental Impact Assessment Regulations, 2014

ENVIRONMENTAL MANAGEMENT (ENVM202)

Theory:	2 periods per week	
Tutorial:	1 period per week	
Semester Mark:	Test 1	- 15%
	Test 2	- 15%
	Assignments	- 10%
	Control Test	- 60%

SYLLABUS

1. Impact of recent legislation on business - response to demands for redress and equity. Human resource function. Professionalism and ethics. Creative thinking
Devise strategies to enable a business to respond to the challenges of the macro business environment.
2. Corporate social responsibility. Human Rights, Inclusivity and Environmental issues
Team performance assessment and Conflict management
Business Sectors and their environments
Management and Leadership
Quality of Performance within business functions
3. Investment: Securities; Investment: Insurance
Forms of ownership and their impact on the business operation; Presentation of information and data response

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

Theory:	4 periods per week	
Semester Mark:	Two Tests:	- 20% each
	Control Test:	60% (subminimum of 40% restricted open book)
		No Examination; 100% course mark

SYLLABUS

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

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

Theory: 1 period per week
Semester Mark: One Industry based - 100%
Project

SYLLABUS

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

INTERPRETATION OF DOCUMENTATION IB (INDO101)

Theory: 2 periods per week
Semester Mark: Two Tests: - 15% each
Assignment: - 10%
Control Test: - 60% (with 40% subminimum)

SYLLABUS

1. Construction process:
 - Six stages of a construction project
 - Parties involved in each stage
 - Documentation for various stages
2. Structure of a tender and contract data:
 - Volume 1: Tendering Procedures
 - Volume 2: Returnable documents
 - Volume 3: Draft Contract
3. Contract administration:
 - Communications
 - Managing time
 - Changes to the price for the works
 - Payment certificates and invoicing
 - Disputes
 - Termination of a contract

SYLLABUS

1. Soils
2. Bitumen
3. Concrete
4. Laboratory Practicals

INTRODUCTION TO PRICE ANALYSIS 2A (INPA201)

Theory:	2 periods per week	
Tutorial:	N/A	
Practical:	N/A	
Semester Mark:	Two Tests:	- 15% each
	Assignment:	- 10%
	Control Test:	- 60% (with 40% subminimum)

SYLLABUS

1. Various methods of inviting tenders
2. Methods of tendering
3. Estimating versus Costing
4. Approximate estimating
5. Unit rates
6. Analysis of prices:

Excavator	Carpenter and Joiner
Concreter	Plasterer
Bricklayer	Drain layer

LABOUR RELATIONS (LARE201)

Theory:	2 periods per week	
Tutorial:	1 period per week	
Semester Mark:	Test I	- 20%
	Assignments	- 20%
	Control Test	- 60%

SYLLABUS

1. Introduction
 - Basic Legal Concepts
 - Judicial System
 - Source of the Law
 - Main Divisions of the Law
2. Contractual Capacity
 - Minor
 - Contractual Capacity of a minor
 - Married Persons
3. Agreement
 - Introduction
 - Offer and acceptance
 - Duration of an offer
 - Revocation

- Lapsing
- Acceptance
- Contract without Agreement

MATERIALS IB (MTRSI01)

Theory: 2 periods per week

Tutorial: N/A

Practical: N/A

Semester Mark: Two Tests: - 15% each
 Assignment: - 10%
 Control Test: - 60% (with 40% subminimum)

SYLLABUS

- | | |
|-------------|-------------|
| 1. Soils | 4. Timber |
| 2. Concrete | 5. Metal |
| 3. Bricks | 6. Aluminum |

MATHEMATICS FOR THE BUILT ENVIRONMENT IA (MFBEI01)

Theory: 2 periods per week

Tutorial: 2 period per week

Semester Mark: Test 1 - 50%
 Test 2 - 50%

SYLLABUS

1. Numbers: Integers, Primes, Divisibility, Rational Numbers, Exponential Notation, Bases and Number Representation, Binary Number System, Infinity
2. Algebra: Variables, Legal and Illegal Algebraic Manipulations, Units, Powers and Roots, Logarithms, Quadratic, Equations, Polynomials, Inequalities, Complex Numbers, Function, Expressions, Equations and Inequalities, Sigma Notation
3. Analytic Geometry: Function and Graphs, (Linear, Quadratic, Circular, Rectangular Hyperbolic, Piecemeal, Absolute Value, Trigonometric, Exponential, Logarithmic), Perimeter, Area and Volume, Proportion, Conic Section
4. Trigonometry: Pythagorean Theorem, Pi π , Sine and Cosine, Tangent and Secant, Ratios, Complex Plane, de Moivre's and Euler's Theorems, Hyperbolic Functions
5. Series: Elementary, Power, Convergence, Taylor, L'Hopital, Bernoulli

6. Calculus: Differentiation and Integration
7. Theory relating to linear algebra
8. Theory related to linear programming

MATHEMATICS FOR THE BUILT ENVIRONMENT IB (MFBE102)

Theory:	2 periods per week	
Tutorial:	2 period per week	
Semester Mark:	Test 1	- 50%
	Test 2	- 50%

SYLLABUS

1. Probability: Discreet Probability Distributions, Continuous Probability Densities, Combinatorics (Permutations and Combinations), Conditional Probability (Discrete, Continuous and Paradoxes), Distributions and Densities, Expected Value and Variance, Sums and Random Variables, Laws of Large Numbers, Central Limit Theorem, Generating Functions (Discrete Distributions, Branching Processes, Continuous, Densities), Markov Chains, Random Walks
2. Statistics: Analysis and Relationship Modelling, Observed Data and Graphical Representation, Parameter Estimation, Model Verification, Linear Models and Linear Regression, Error Analysis, Data Projection, Analysis and Modelling, Trend Analysis, Cluster and Factor Analysis
3. Logic and Set Theory: Proof by Induction, Unions, Intersections, Difference, Symmetry
4. Probability theory and distribution
5. Statistical inference techniques theory
6. Correlation of regression analysis theory

MECHANICS FOR THE BUILT ENVIRONMENT (MFBE201)

Theory:	2 periods per week	
Tutorial:	1 period per week	
Semester Mark:	Test 1	- 10%
	Test 2	- 15%
	Practical 1	- 5% (Subminimum 50%)
	Practical 2	- 5% (Subminimum 50%)
	Control Test	- 60%

SYLLABUS

- I. Mechanics:
 - Forces
 - Parallelogram of forces
 - Triangle of forces
 - Polygon of forces
 - Analytical solutions
- 2 Centroids:
 - Lamina
 - Solid bodies
3. Stress and Strain:
 - Elasticity
 - Deformation
- 4 Introductions to Moments:
 - Reactions of simply supported beams
 - Shear force and Bending moments
- 5 Frames (Roof trusses):
 - Graphical solution

SITE SURVEYING (MFBE201)

Theory: 2 periods per week

Tutorial: 1 period per week

Semester Mark:	Test 1	- 15%
	Test 2	- 15%
	Assignment	- 10%
	Control Test	- 60%

SYLLABUS

1. Linear surveying + measurements
2. Setting out
3. Levelling
4. Gradients (including road and sewer levels)
5. Introduction to drainage systems
6. Introduction to areas and volumes of cut and fills
7. Introduction to traversing
8. Elementary tachometry
9. Contours
10. Survey of existing buildings

QUANTITIES & DOCUMENTATION IB (QUDOI01)

Theory: 2 periods per week

Semester Mark: One Test: - 10%
Two Assignments: - 15% each
Control Test: - 60% (with 40% subminimum)

SYLLABUS

1. Substructure:
2. Superstructure:
3. Roof construction and covering:
4. Finishes:
5. Openings and adjustments:

QUANTITIES & DOCUMENTATION 2A (QUDO201)

Theory: 2 periods per week

Tutorial: N/A

Practical: N/A

Semester Mark: One Test: - 10%
Two Assignments: - 15% each
Control Test: - 60% (with 40% subminimum)

SYLLABUS

1. Undertaking of basic descriptive quantification for small complex structures
2. Critical appraisal of the project design
3. The sequence of measurement
4. Take-off quantities on dimension paper
5. Measurement clauses and the application thereof
6. Compilation of price determination documents in schedule format

QUANTITIES & DOCUMENTATION 2B (QUDO202)

Theory: Two periods per week

Tutorial: N/A

Practical: N/A

Semester Mark: Two tests- 15% each
Assignment- 10%
Control Test- 60% (Subminimum of 40%)

SYLLABUS

1. Undertaking of basic descriptive quantification for medium sized structures
2. Critical appraisal of the project design
3. The sequence of measurement
4. Take-off quantities on dimension paper
5. Measurement clauses and the application thereof
6. Compilation of price determination documents in schedule format

QUANTITY SURVEYING IA (QUSUI01)

Theory: 2 periods per week

Tutorial: N/A

Practical: N/A

Semester Mark: One Test: - 10%

Two Assignments: - 15% each

Control Test: - 60% (with 40% subminimum)

SYLLABUS

1. Background of Quantity Surveying
 2. Fundamentals of mensuration
 3. Construction drawings and specifications
 4. Basic descriptive quantification
- Price determination document