2010
PROSPECTUS

PART 3

FACULTY OF ENGINEERING AND
THE BUILT ENVIRONMENT

ISSN 0258-7343

TSHWANE UNIVERSITY OF TECHNOLOGY
PARTS OF THE PROSPECTUS

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Faculty of Information and Communication Technology    Part 5  
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PLEASE NOTE

Although the information in this Prospectus has been compiled as accurately as possible, the Council accepts no responsibility for any inaccuracies in this publication. This Prospectus is valid for 2010 only.

The "overview of syllabus" is only an outline of the syllabus of a subject. The complete syllabus of a subject appears in the subject study guide.

Prospective students will not be admitted to any qualification without prior evaluation.

The closing date for applications for admission to first-semester and year courses is 15 August of the preceding year, except for certain courses of which the closing date is 15 June. The closing date for second-semester courses is 15 May of the year concerned.

THE INDICATED APPLICATION FEES MUST ACCOMPANY ALL APPLICATIONS.

Important:
TUT admission requirements for entry-level programmes adhere to national legislation and therefore the following are required:
• BEd degrees: at least four subjects at a performance level 4.
• National Diplomas: at least four subjects at performance level 3.
• Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP).

Please verify specific and additional requirements per programme as indicated in the prospectus.

ACCEPTANCE IS SUBJECT TO AVAILABLE CAPACITY ACCORDING TO THE STUDENT ENROLMENT PLAN (SEP)

Alternative and international qualifications (e.g. HIGSCE, IGCSE, NSSC A&O Level, IB Higher and Standard Level) will be assessed on the equivalent basis by the South African Qualifications Authority, and a full or conditional exemption certificate will be issued. This exemption certificate is a prerequisite for all students who want to enrol for undergraduate studies. The Tshwane University of Technology cannot obtain this certificate on your behalf. Candidates may also apply for recognition of prior learning at the Office of the Registrar. The specific relevant documentation will be requested from these applicants, and these cases will be handled on an individual basis. Candidates from private schools in South Africa (who did not write any of the examinations mentioned above) may apply to the Office of the Registrar for admission via the Senate’s discretionary route.
ENQUIRIES

Contact Centre
Tel. 086 1102 421  Fax: 086 110 2421

Admission Enquiries
Tel. 012 382 5750

The Registrar
Private Bag X680  
PRETORIA 0001
Tel. 012 382 5911  Fax: 012 382 5114

ARCADIA CAMPUS
Private Bag X680  175 Nelson Mandela Drive
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The Campus Director
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PRETORIA 0001  PRETORIA WEST
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SOSHANGUVE CAMPUS
Private Bag X680  2 Aubrey Matlala Road, Block K
PRETORIA 0001  SOSHANGUVE
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NELSPRUIT CAMPUS
The Campus Director
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The Campus Director
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POLOKWANE 0700  POLOKWANE
Tel. 015 287 0700  Fax: 015 297 7609

Enquiries relating to fees:

The Chief Financial Officer
Private Bag X680  
PRETORIA 0001
Tel. 086 1102 422  Fax: 012 382 5701
**FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT**

On 6 July 2009, this faculty had the following staff members:

Dean: **Prof F Otiendo - PrEng (SA), CEng (UK), REng (Kenya), FSAICE (SA), MCIWEM (UK), MEIK (Kenya), SFIWVM (SA), BSc (Hons) (Civil Engineering) (University of Nairobi, Kenya), MSc (Civil Engineering) (University of Newcastle Upon Tyne, UK), PhD (Civil Engineering) (University of Newcastle Upon Tyne, UK), MBA (University of Durban Westville)**

Telephone: 012 382 5120  
Office: Room 622B, Building 3, Pretoria Campus

<table>
<thead>
<tr>
<th>NAME</th>
<th>TITLE</th>
<th>QUALIFICATION(S)</th>
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<tbody>
<tr>
<td><strong>DEPARTMENT OF ARCHITECTURE</strong></td>
<td></td>
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</tr>
<tr>
<td>Ms M Bolt</td>
<td>Senior Lecturer</td>
<td>BArch (UP)</td>
</tr>
<tr>
<td>Mr P Greyvensteyn</td>
<td>Senior Lecturer</td>
<td>MArch (Wits)</td>
</tr>
<tr>
<td>Mr CG Joubert</td>
<td>Senior Lecturer</td>
<td>BArch (UP)</td>
</tr>
<tr>
<td>Mr MO Odebiyi</td>
<td>Lecturer</td>
<td>MSc (Architecture) (ABU)</td>
</tr>
<tr>
<td>Mr EP Pieters</td>
<td>Head of Department</td>
<td>BArch (UP)</td>
</tr>
<tr>
<td>Mr AL Roodt</td>
<td>Senior Lecturer</td>
<td>M Tech (Architectural Technology) (Tech Pta)</td>
</tr>
<tr>
<td>Mr S Schmidt</td>
<td>Senior Lecturer</td>
<td>BArch (UP)</td>
</tr>
<tr>
<td>Prof GS Steyn</td>
<td>Research Professor</td>
<td>PhD Architecture (UP)</td>
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<tr>
<td>Mr DJ Steynberg</td>
<td>Senior Lecturer</td>
<td>BArch (UP)</td>
</tr>
<tr>
<td>Mr J van Bergen</td>
<td>Senior Lecturer</td>
<td>Graduate Diploma (Historical Theories) (AA)</td>
</tr>
<tr>
<td>Mr HN van der Linde</td>
<td>Lecturer</td>
<td>B Tech (Architectural Technology) (TUT)</td>
</tr>
<tr>
<td>Mr M van Schoor</td>
<td>Lecturer</td>
<td>N Dip (Architectural Technology) (Tech Pta)</td>
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<tr>
<td><strong>DEPARTMENT OF BUILDING SCIENCES</strong></td>
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<tr>
<td>Ms R Geertsema</td>
<td>Lecturer</td>
<td>M Tech (Construction Management) (TUT)</td>
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<tr>
<td>Mr WP Jansen van Rensburg</td>
<td>Head of Department</td>
<td>BSc (QS) PrQS (UP)</td>
</tr>
<tr>
<td>Mr GJ Meintjes</td>
<td>Senior Lecturer</td>
<td>MSc (Project Management) (UP), PrQS (UP)</td>
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<tr>
<td>Mr E Mwanaumo</td>
<td>Lecturer</td>
<td>MSc (Project Management) (UP)</td>
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<tr>
<td>Ms V Ranjit</td>
<td>Lecturer</td>
<td>B Tech (Construction Management) (Durban Institute of Technology)</td>
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<tr>
<td>Mr NTS van der Walt</td>
<td>Senior Lecturer</td>
<td>BSc (QS) PrQS (UP)</td>
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<tr>
<td><strong>DEPARTMENT OF CHEMICAL AND METALLURGICAL ENGINEERING</strong></td>
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<tr>
<td>Mr D Delport</td>
<td>Lecturer</td>
<td>M Dip Tech (Chemistry) (Tech Pta)</td>
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<tr>
<td>Mr V Hlongwane</td>
<td>Lab Technician</td>
<td>N Dip (Engineering) (Chemical) (CPUT)</td>
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<tr>
<td>Prof H Kasaini</td>
<td>Extraordinary Professor</td>
<td>PhD (Engineering) (Chemical) (Japan)</td>
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<tr>
<td>Mr KK Kgatle</td>
<td>Lecturer</td>
<td>NH Dip (Engineering) (Chemical) (Wits)</td>
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<tr>
<td>Dr A Kolesnikov</td>
<td>Principal Lecturer</td>
<td>PhD (Engineering) (Chemical) (Moscow Institute of Chemical Engineering, Russia)</td>
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<tr>
<td>Dr RKK Mbaya</td>
<td>Lecturer</td>
<td>D Tech (Engineering) (Chemical) (TUT)</td>
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<tr>
<td>Mr M Mosesane</td>
<td>Lab Technician</td>
<td>N Dip (Engineering) (Chemical) (TUT)</td>
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<tr>
<td>Ms NN Nthite</td>
<td>Administrator</td>
<td>B Tech (Office Management and Technology) (TUT)</td>
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<tr>
<td>Dr M Onyango</td>
<td>Senior Lecturer</td>
<td>DEng (Engineering) (Chemical) (Nagoya University, Japan)</td>
</tr>
<tr>
<td>Ms API Popoola</td>
<td>Acting Sectional Head</td>
<td>M Tech (Engineering) (Metallurgy) (TUT)</td>
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<tr>
<td>Mr K Premfllar</td>
<td>Lab Technician</td>
<td>M Tech (Engineering) (Chemical) (TUT)</td>
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<tr>
<td>Mr M Ranyaoa</td>
<td>Head of Department</td>
<td>MSc (Engineering) (Chemical) (Sofia University, Bulgaria)</td>
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<tr>
<td>Ms LC Tshabalala</td>
<td>Lab Technician</td>
<td>B Tech (Engineering) (Metallurgy) (TUT)</td>
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<td><strong>DEPARTMENT OF CIVIL ENGINEERING</strong></td>
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<tr>
<td>Dr CE Ackerman</td>
<td>Senior Lecturer</td>
<td>D Tech (Engineering) (Civil) (Tech Pta)</td>
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<tr>
<td>Mr RFA Berkers</td>
<td>Lecturer</td>
<td>M Tech (Engineering) (Civil) (TUT)</td>
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<tr>
<td>Ms DA Branga-Peicu</td>
<td>Senior Lecturer</td>
<td>MSc (Water Engineering) (Institutul de Constructi Bucuresti – Facultate de Hidrotehnica)</td>
</tr>
<tr>
<td>Mr DJJ Coetzee</td>
<td>Laboratory Manager</td>
<td>N Dip (Engineering) (Civil) (Tech Pta)</td>
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<tr>
<td>Mr FS Crofts</td>
<td>Principal Lecturer</td>
<td>BEng (Civil) (UP), GDE (Wits)</td>
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<tr>
<td>Mr CJ de Jager</td>
<td>Senior Lecturer</td>
<td>BEng (Civil) (UP)</td>
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<tr>
<td>Dr CJ Louw</td>
<td>Lecturer</td>
<td>PhD (Mathematics) (UP)</td>
</tr>
<tr>
<td>Mr RJ Moloisane</td>
<td>Lecturer</td>
<td>M Tech (Engineering) (Civil) (cum laude) (TUT)</td>
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<tr>
<td>Ms DM Ngoma</td>
<td>Departmental Administrator</td>
<td>B Tech (Office Management and Technology) (TNW)</td>
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<td>Dr GM Ochieng</td>
<td>Acting Head of Department and Senior Lecturer</td>
<td>D Tech (Engineering) (Civil) (TUT)</td>
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<tr>
<td>Mr SE Seanego</td>
<td>Senior Lecturer</td>
<td>BSc (Hons) (Structural Engineering) (UP)</td>
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<tr>
<td>Mr J Snyman</td>
<td>Senior Lecturer</td>
<td>M Dip Tech (Engineering) (Civil) (Tech Pta)</td>
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<tr>
<td>Ms S van der Merwe</td>
<td>Departmental Administrator</td>
<td>B Tech (Business Information Systems) (TUT)</td>
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<tr>
<td>Mr OR Tshepe</td>
<td>Lecturer</td>
<td>NH Dip (Engineering) (Civil) (Tech Pta)</td>
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<tr>
<td>Dr WA van Wyngaard</td>
<td>Principal Lecturer</td>
<td>D Tech (Engineering) (Civil) (Tech Pta)</td>
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<td>Mr JC van Zyl</td>
<td>Principal Lecturer</td>
<td>MEng (Engineering) (Civil) (US)</td>
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<td><strong>DEPARTMENT OF ELECTRICAL ENGINEERING</strong></td>
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<tr>
<td>Mrs BT Abe</td>
<td>Lecturer (eMalahleni Campus)</td>
<td>MEng (Engineering) (Electrical) (Federal University of Technology) (Akure, Nigeria)</td>
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<tr>
<td>Mr RC Aylward</td>
<td>Principal Lecturer</td>
<td>M Tech (Engineering) (Electrical) (Digital Technology) (TUT)</td>
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<tr>
<td>Mr L Botha</td>
<td>Senior Lecturer</td>
<td>B Tech (Engineering) (Electrical) (TUT)</td>
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<tr>
<td>Mr AC de Villiers</td>
<td>Lecturer</td>
<td>BEng (Hons) (RF and Electromagnetism) (UP)</td>
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<tr>
<td>Mr J de Vries</td>
<td>Senior Technician</td>
<td>B Tech (Engineering) (Electrical) (Digital Technology) (Tech Pta)</td>
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<tr>
<td>Prof OD Dintchev</td>
<td>Principal Lecturer</td>
<td>MSc (Electrical) (Wits)</td>
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<tr>
<td>Mr GS Donev</td>
<td>Senior Lecturer</td>
<td>MEng (Engineering) (Electrical) (Bulgeria)</td>
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<td>Mr PJ Ehlers</td>
<td>Senior Lecturer</td>
<td>BEng (Hons) (Engineering) (Electrical) (UP)</td>
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<td>Mr HD Esterhuizen</td>
<td>Senior Lecturer</td>
<td>M Tech (Engineering) (Electrical) (Tech Pta)</td>
</tr>
<tr>
<td>Mr JH Hofmeyr</td>
<td>Lecturer</td>
<td>B Tech (Engineering) (Electrical) (High-Frequency Technology) (TUT)</td>
</tr>
<tr>
<td>Name</td>
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<tr>
<td>Prof AA Jimoh</td>
<td>Head of Department</td>
<td>PhD (Engineering) (Electrical) (McMaster University, Canada)</td>
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<td>Dr J Jordaan</td>
<td>Senior Lecturer</td>
<td>D Tech (Engineering) (Electrical) (TUT)</td>
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<tr>
<td>Mr AB Khalaf</td>
<td>Senior Lecturer</td>
<td>M Tech (Engineering) (Electrical) (Clinical Engineering) (TUT)</td>
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<td>Mr LJJ Kruger</td>
<td>Senior Technician</td>
<td>N Dip (Engineering) (Electrical) (Process Instrumentation) (Tech Pta)</td>
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<tr>
<td>Mr AM Kurien</td>
<td>Senior Lecturer</td>
<td>M Tech (Engineering) (Electrical) (Telecommunication Technology) (Tech Pta/F’SATIE)</td>
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<tr>
<td>Mr H Le Roux</td>
<td>Technician</td>
<td>B Tech (Engineering) (Electrical) (Digital Technology) (TUT)</td>
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<td>Mr JJ Louw</td>
<td>Senior Lecturer</td>
<td>MBA (Technical Management) (UP)</td>
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<td>Mr ET Makguba</td>
<td>Junior Lecturer</td>
<td>B Tech (Engineering) (Electrical) (TUT)</td>
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<tr>
<td>Mr LA Makwange</td>
<td>Lecturer</td>
<td>N Dip (Engineering) (Electrical) (Cape Peninsula Tech)</td>
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<td>Mr E Malan</td>
<td>Lecturer</td>
<td>B Tech (Engineering) (Electrical) (TUT)</td>
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<td>Mr L Malatjie</td>
<td>Laboratory Technician</td>
<td>B Tech (IT) (Software Development) (TUT)</td>
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<td>Mr MXSD Mankazana</td>
<td>Lecturer</td>
<td>NH Dip (Engineering) (Electrical) (Cape Peninsula Tech)</td>
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<td>Mr DT Matshiba</td>
<td>Lecturer</td>
<td>B Tech (Engineering) (Electrical) (TUT)</td>
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<td>Mr GL Moepi</td>
<td>Laboratory Technician</td>
<td>N Dip (Engineering) (Computer Systems) (TNG)</td>
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<td>Mr TA Mokoena</td>
<td>Lecturer</td>
<td>B Tech (Engineering) (Electrical) (Telecommunication Technology) (Tech Pta)</td>
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<td>Mr MC Mostoen</td>
<td>Lecturer</td>
<td>B Tech (Engineering) (Electrical) (TUT)</td>
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<td>Mr AJJ Mouton</td>
<td>Senior Lecturer</td>
<td>M Tech (Engineering) (Electrical) (Digital Technology) (TUT)</td>
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<tr>
<td>Ms BN Msiza</td>
<td>Departmental Administrator</td>
<td>B Tech (Business Administration) (TUT)</td>
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<tr>
<td>Dr JL Munda</td>
<td>Senior Lecturer</td>
<td>DEng (Engineering) (Electrical) (Ryukyu, Japan)</td>
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<tr>
<td>Prof DV Nicolae</td>
<td>Associate Professor (eMalalheleni Campus)</td>
<td>D Tech (Engineering) (Electrical) (Vaal University of Technology)</td>
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<tr>
<td>Mr HJ Nel</td>
<td>Senior Technician</td>
<td>N6 Cert (Electrician) (Technical College) (Olifantsfonteine)</td>
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<tr>
<td>Mr Ntsandeni</td>
<td>Lecturer</td>
<td>B Tech (Engineering) (Electrical) (Telecommunication Technology) (Wits Tech)</td>
</tr>
<tr>
<td>Mr LI Onwuegbuna</td>
<td>Lecturer</td>
<td>MSc (Electromagnetic with bias on antenna design) (Wits)</td>
</tr>
<tr>
<td>Mr OJ Oyedapo</td>
<td>Lecturer</td>
<td>MSc (Electronics) (UP)</td>
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<tr>
<td>Mr JC Pretorius</td>
<td>Acting Sectional Head and Lecturer (Nelspruit Campus)</td>
<td>BEng (Hons) (Electronic Engineering) (UP)</td>
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<tr>
<td>Prof G Qi</td>
<td>Professor</td>
<td>PhD (Control Theory and Control Engineering) (Nankai University, China)</td>
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<tr>
<td>Mr CG Richards</td>
<td>Lecturer (eMalalheleni Campus)</td>
<td>MSc (Electronic Engineering) (École Supérieure d’Ingenieurs en Électronique et Électrotechnique) (Paris)</td>
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<tr>
<td>Mr J Sebastian</td>
<td>Lecturer</td>
<td>BEng (Hons) (Micro-Electronic) (UP)</td>
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<tr>
<td>Mr NL Sebothoma</td>
<td>Senior Lecturer</td>
<td>NH Dip (Engineering) (Electrical) (Vaal Triangle Tech)</td>
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<tr>
<td>Mr S Sewpersad</td>
<td>Senior Technician</td>
<td>N Dip (Engineering) (Electrical) (Digital Technology) (Tech Pta)</td>
</tr>
<tr>
<td>Name</td>
<td>Position/Role</td>
<td>Qualification</td>
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<tr>
<td>Mr DR Shongwe</td>
<td>Laboratory Technician</td>
<td>N Dip (Engineering) (Electrical) (Northern Transvaal Tech)</td>
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<tr>
<td>Mr M Siti</td>
<td>Lecturer</td>
<td>MSc (Electrical) (UP)</td>
</tr>
<tr>
<td>Ms MJ Smit</td>
<td>Senior Financial Controller</td>
<td>N Dip (Internal Auditing) (Tech Pta)</td>
</tr>
<tr>
<td>Prof LW Snyman</td>
<td>Professor</td>
<td>PhD (Physics) (UPE)</td>
</tr>
<tr>
<td>Mr N Steyn</td>
<td>Lecturer</td>
<td>M Tech (Engineering) (Electrical) (Process Instrumentation) (TUT)</td>
</tr>
<tr>
<td>Mr GM Strydom</td>
<td>Senior Lecturer (eMalahleni Campus)</td>
<td>BSc (Engineering) (Electrical) (UP)</td>
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<tr>
<td>Ms H Swanepoel</td>
<td>Administrative Officer</td>
<td>B Tech (Office Management and Technology) (TUT)</td>
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<td>Mr S Themba</td>
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<td>B Tech (Engineering) (Electrical) (TUT)</td>
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<td>Mr PR Tjale</td>
<td>Lecturer</td>
<td>NH Dip (Engineering) (Electrical) (Vaal Triangle Tech)</td>
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<tr>
<td>Mr P Tshubwana</td>
<td>Junior Lecturer (eMalahleni Campus)</td>
<td>B Tech (Engineering) (Electrical) (Power Engineering) (TUT)</td>
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<tr>
<td>Mr C van der Merwe</td>
<td>Lecturer</td>
<td>BSc (Engineering) (Electrical) (Electrotechnical Engineering) (UP)</td>
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<tr>
<td>Mr JM van Dyk</td>
<td>Senior Technician</td>
<td>NTD (Centurion Technical College)</td>
</tr>
<tr>
<td>Ms M van Wyk</td>
<td>Lecturer</td>
<td>B Tech (Tertiary Education) (Tech Pta)</td>
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<td>Ms C Viljoen</td>
<td>Departmental Administrator</td>
<td>N Dip (Office Management and Technology) (Tech Pta)</td>
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<tr>
<td>Mr AJ Visser</td>
<td>Lecturer</td>
<td>BEng MSc (Engineering) (Electrical) (US)</td>
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<td>Mr DP Zikalala</td>
<td>Junior Lecturer</td>
<td>B Tech (Engineering) (Electrical) (Power Engineering) (TUT)</td>
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<tr>
<td>Mr T Wanjekeche</td>
<td>Lecturer</td>
<td>MSc (Engineering) (Electrical) (University of Nairobi)</td>
</tr>
</tbody>
</table>

**DEPARTMENT OF GEOMATICS**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Role</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr JIP Bisschoff</td>
<td>Senior Lecturer</td>
<td>B Tech (Surveying) (Tech Pta)</td>
</tr>
<tr>
<td>Mr MA Kwinda</td>
<td>Lecturer</td>
<td>BAdmin (Hons) (Unisa), B Tech (Surveying) (TUT)</td>
</tr>
<tr>
<td>Mr NF Laurie</td>
<td>Acting Head of Department and Senior Lecturer</td>
<td>B Tech (Engineering) (Civil) (Tech Pta)</td>
</tr>
<tr>
<td>Mr K Neluembeni</td>
<td>Laboratory Technician</td>
<td>B Tech (Logistics)</td>
</tr>
<tr>
<td>Ms A Viljoen</td>
<td>Secretary</td>
<td>Senior Certificate</td>
</tr>
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</table>

**DEPARTMENT OF INDUSTRIAL ENGINEERING**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Role</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr G de Clercq</td>
<td>Lecturer</td>
<td>MBA (Univ of Wales)</td>
</tr>
<tr>
<td>Ms MG Kanakana</td>
<td>Acting Head of Department and Lecturer</td>
<td>MBA (Nelson Mandela University)</td>
</tr>
<tr>
<td>Mr T Nenzhelele</td>
<td>Lecturer</td>
<td>M Tech (Industrial Engineering) (TUT)</td>
</tr>
<tr>
<td>Name</td>
<td>Position</td>
<td>Qualification</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mr CT Abraham</td>
<td>Lecturer</td>
<td>BEng (Bangalore University, India)</td>
</tr>
<tr>
<td>Ms IEA Aghachi</td>
<td>Senior Lecturer</td>
<td>MSc (Engineering) (Mechanical) (Wits)</td>
</tr>
<tr>
<td>Mr LW Beneke</td>
<td>Section Head</td>
<td>MSc (Maths Technology) (University of Southern Mississippi, USA)</td>
</tr>
<tr>
<td>Mr DA Desai</td>
<td>Lecturer</td>
<td>M Dip Tech (Engineering) (Mechanical) (Tech Pta)</td>
</tr>
<tr>
<td>Mr C Duff</td>
<td>Senior Technologist</td>
<td>B Tech (Industrial Design) (Wits Tech)</td>
</tr>
<tr>
<td>Mr JC Fwamba</td>
<td>Junior Lecturer</td>
<td>B Tech (Engineering) (Mechanical) (TUT)</td>
</tr>
<tr>
<td>Mr CH Hancke</td>
<td>Senior Lecturer</td>
<td>NH Dip (Post-School Ed) (TUT)</td>
</tr>
<tr>
<td>Ms MC Khoathane</td>
<td>Lecturer</td>
<td>M Tech (Polymer Technology) (TUT)</td>
</tr>
<tr>
<td>Mr L Mabena</td>
<td>Junior Lecturer</td>
<td>B Tech (Transport Economics) (UJ)</td>
</tr>
<tr>
<td>Mr FM Mashile</td>
<td>Junior Lecturer</td>
<td>B Tech (Engineering) (Metallurgical Engineering) (UP)</td>
</tr>
<tr>
<td>Prof M Mbarawa</td>
<td>Head of Department and Associate Professor</td>
<td>PhD (Engineering) (University of New South Wales, Australia)</td>
</tr>
<tr>
<td>Mr CF Meyer</td>
<td>Principal Lecturer</td>
<td>MEng (Mechanical) (UJ)</td>
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<tr>
<td>Mr JK Nwamba</td>
<td>Lecturer</td>
<td>B Tech (Engineering) (Mechanical) (Peninsula Tech)</td>
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<tr>
<td>Mr PA Oosthuizen</td>
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<td>M Dip Tech (Industrial Design) (Wits Tech)</td>
</tr>
<tr>
<td>Mr OB Reeksting</td>
<td>Lecturer</td>
<td>NH Dip (Analytical Chemistry) (Tech Pta)</td>
</tr>
<tr>
<td>Ms E Relling</td>
<td>Lecturer</td>
<td>MSc (Chemistry) (Wits)</td>
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<td>Prof ER Sadiku</td>
<td>Professor</td>
<td>PhD (Polymer Physics) (Strathclyde)</td>
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<tr>
<td>Mr JL Scribante</td>
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<td>Mr CB Steyn</td>
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<tr>
<td>Mr P van Rhyn</td>
<td>Senior Technologist</td>
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</tr>
<tr>
<td>Mr HG van Zyl</td>
<td>Senior Lecturer</td>
<td>MDip Tech (Engineering) (Mechanical) (Tech Pta), Dip (Tertiary Education) (UP)</td>
</tr>
<tr>
<td>Mr MD Wythe</td>
<td>Lecturer</td>
<td>MDes RCS (ID Eng) (London)</td>
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<td></td>
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<td>SUBJECT INFORMATION</td>
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</table>
1. DEPARTMENT OF ARCHITECTURE

1.1 BACCALAUREUS TECHNOLOGIAE: ARCHITECTURE: PROFESSIONAL
Qualification code: BTPS09

REMARKS

a. Admission requirement(s):
   For students who obtained a Senior Certificate before 2008: A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics.
   For students who have obtained a National Senior Certificate since 2008: A National Senior Certificate or an equivalent qualification, with English (4) and Mathematics or Mathematical Literacy (4).

b. Recommended subject(s): None.

c. Selection criteria: Admission Point Score (APS) and assessment procedures:
   Candidates with an APS score of 24+ will be required to undergo additional assessment of a written three-hour test to obtain admission.

   FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
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<tr>
<td>7</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
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<tr>
<td>3</td>
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<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

   Total APS score: 24 (six subjects)

   FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

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<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
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</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or</td>
<td>4</td>
</tr>
<tr>
<td>first additional language</td>
<td></td>
</tr>
<tr>
<td>Mathematics or</td>
<td>4</td>
</tr>
<tr>
<td>Mathematical Literacy</td>
<td></td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any four other subjects with</td>
<td></td>
</tr>
<tr>
<td>a final score of 16</td>
<td></td>
</tr>
</tbody>
</table>

   **TOTAL APS SCORE** (six subjects, excluding Life Orientation) 24

d. Minimum duration: Four years.

e. Presentation and campus: Pretoria Campus (first three years: day classes, fourth year: day and block-based classes).
   Please note that the campus indicated is subject to change and confirmation.
f. Intake for the qualification: January only.

g. Readmission: See Chapter 3 of Students' Rules and Regulations.

h. Accreditation by professional body: This qualification has been accredited by the South African Council for the Architecture Profession (SACAP).

i. Class timetables and class times: Students will be permitted to register for subjects in different year groups only if the timetables for those subjects do not coincide. Students should, therefore, take note of class timetables and class times before registering.

j. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 4,000.

### FIRST YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
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<td>ABC100B</td>
<td>Applied Building Science I</td>
<td>(0,100)</td>
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<tr>
<td>ACH100T</td>
<td>Architectural Design I</td>
<td>(0,212)</td>
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<tr>
<td>CAI110T</td>
<td>Computer-Aided Draughting I</td>
<td>(0,041)</td>
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<tr>
<td>CDO100T</td>
<td>Contract Documentation I</td>
<td>(0,133)</td>
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<tr>
<td>COA110B</td>
<td>Computer Applications I</td>
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<td>COM150C</td>
<td>Communication I</td>
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<tr>
<td>CSM110T</td>
<td>Construction Materials I</td>
<td>(0,083)</td>
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<tr>
<td>HAC100T</td>
<td>History of Architecture I</td>
<td>(0,066)</td>
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<tr>
<td>KME110T</td>
<td>Construction Methods I</td>
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<tr>
<td>PTT100T</td>
<td>Presentation Techniques I</td>
<td>(0,083)</td>
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<tr>
<td>THD100T</td>
<td>Theory of Design I</td>
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TOTAL CREDITS FOR THE FIRST YEAR: 1,000

### SECOND YEAR

<table>
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<tr>
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<tbody>
<tr>
<td>ACH200T</td>
<td>Architectural Design II</td>
<td>(0,252)</td>
<td>Architectural Design I</td>
</tr>
<tr>
<td>ARC200T</td>
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<td>CDO200T</td>
<td>Contract Documentation II</td>
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<tr>
<td>CM200T</td>
<td>Computer-Aided Design II</td>
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<tr>
<td>THD200T</td>
<td>Theory of Design II</td>
<td>(0,083)</td>
<td>Theory of Design I</td>
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TOTAL CREDITS FOR THE SECOND YEAR: 1,000

### THIRD YEAR

<table>
<thead>
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<th>PREREQUISITE SUBJECT(S)</th>
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<tbody>
<tr>
<td>ACH300T</td>
<td>Architectural Design III</td>
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<td>Architectural Design II</td>
</tr>
<tr>
<td>AHC300T</td>
<td>Architectural Practice III</td>
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<tr>
<td>BSV300T</td>
<td>Building Services III</td>
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<tr>
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<tr>
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<td>KME310T</td>
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<tr>
<td>SPQ300T</td>
<td>Specification and Quantities III</td>
<td>(0,041)</td>
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<tr>
<td>THD300T</td>
<td>Theory of Design III</td>
<td>(0,083)</td>
<td>Theory of Design II</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE THIRD YEAR: 1,000
FOURTH YEAR

In order to continue with the fourth year, students will be required to have a minimum mark of 70% or a successful portfolio interview for the subject Architectural Design III. Students who do not meet the requirements will be re-registered for the Baccalaureus Technologiae: Architectural Technology (field of specialisation: Technology), which is not accredited by the South African Council for the Architectural Profession (SACAP).

ACH400T Architectural Design IV (0,252) Architectural Design III
CSM400T Construction Materials IV (0,083) Construction Materials III
KME400T Construction Methods IV (0,166) Construction Methods III
LWC400T Law and Contract Management IV (0,083) Architectural Practice III
PJG410T Project Management IV (0,125) Architectural Practice III
PUD400T Principles of Urban Design IV (0,083) Landscape Design III
STR400T Structures IV (0,125) Applied Building Science I
THD400T Theory of Design IV (0,083) Theory of Design III

TOTAL CREDITS FOR THE FOURTH YEAR: 1,000

1.2 MAGISTER TECHNOLOGIAE: ARCHITECTURE: PROFESSIONAL (Structured)
Qualification code: MTPSS0

REMARKS

a. Admission requirement(s): A Baccalaureus Technologiae: Architecture: Professional or an NQF level 7 bachelor’s/honours (Professional) degree in Architecture obtained from a South African university. Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme. Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Admission is subject to selection.

c. Duration: A minimum of two years and a maximum of three years.

d. Presentation and campus: Pretoria Campus (day and block-based classes). Please note that the campus indicated is subject to change and confirmation.

e. Accreditation by professional body: This qualification has been accredited by the South African Council for the Architecture Profession (SACAP).

f. Subject credits: Subject credits are shown in brackets after each subject.
### FIRST YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACH500T</td>
<td>Architectural Design V</td>
<td>(0,125)</td>
<td></td>
</tr>
<tr>
<td>AHC500T</td>
<td>Architectural Practice V</td>
<td>(0,042)</td>
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</tr>
<tr>
<td>ARA500T</td>
<td>Advanced Computer Applications V</td>
<td>(0,021)</td>
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<tr>
<td>BMN500T</td>
<td>Business Management V</td>
<td>(0,042)</td>
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<tr>
<td>CHH500T</td>
<td>Computer Hardware V</td>
<td>(0,021)</td>
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</tr>
<tr>
<td>CSM500T</td>
<td>Construction Materials V</td>
<td>(0,042)</td>
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<tr>
<td>KME500T</td>
<td>Construction Methods V</td>
<td>(0,021)</td>
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<tr>
<td>NSY500T</td>
<td>Network Systems V</td>
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<tr>
<td>THD500T</td>
<td>Theory of Design V</td>
<td>(0,042)</td>
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**TOTAL CREDITS FOR THE FIRST YEAR:** 0,377

### SECOND YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
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<tbody>
<tr>
<td>ATG510T</td>
<td>Research Report: Architecture: Professional V</td>
<td>(0,500)</td>
<td>Architectural Design IV</td>
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<tr>
<td>ATG510R</td>
<td>Research Report: Architecture: Professional V (re-registration)</td>
<td>(0,000)</td>
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<tr>
<td>CDO500T</td>
<td>Contract Documentation V</td>
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<tr>
<td>RMD500D</td>
<td>Research Methodology</td>
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<tr>
<td>SFN500T</td>
<td>Specification V</td>
<td>(0,020)</td>
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</tbody>
</table>

**TOTAL CREDITS FOR THE SECOND YEAR:** 0,623

**TOTAL CREDITS FOR THE QUALIFICATION:** 1,000

### 1.3 BACCALAUREUS TECHNOLOGIAE: ARCHITECTURAL TECHNOLOGY
(Field of specialisation: Technology)
Qualification code: BTAQ95

**REMARKS**

a. Admission requirement(s): A National Diploma: Architectural Technology, an equivalent qualification or the first three years of the Baccalaureus Technologiae: Architecture: Professional. However, this does not apply to students who registered for the National Diploma for the first time before 2008, and who have not since interrupted their studies.

b. Selection criteria: Admission is subject to selection.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (day and block-based classes). Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January only.


g. Subject credits: Subject credits are shown in brackets after each subject.

Key to asterisks * Information does not correspond to information in Report 151. (Deviations approved by Senate in March 2009.)
<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARA400T</td>
<td>Advanced Computer Applications IV</td>
<td>(0,100)</td>
<td>Computer-Aided Draughting III</td>
</tr>
<tr>
<td>CDG400T</td>
<td>Computer-Aided Draughting IV</td>
<td>(0,050)</td>
<td>Computer-Aided Draughting III</td>
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<tr>
<td>CDG40PT</td>
<td>Computer-Aided Draughting: Computer Hardware IV</td>
<td>(0,050)</td>
<td>Computer-Aided Draughting III</td>
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<tr>
<td>CDG40QT</td>
<td>Computer-Aided Draughting: Network Systems IV</td>
<td>(0,050)</td>
<td>Computer-Aided Draughting III</td>
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<tr>
<td>CDL400T</td>
<td>Construction and Detailing IV</td>
<td>(0,050)</td>
<td>Construction Methods III</td>
</tr>
<tr>
<td>CDL40PT</td>
<td>Construction and Detailing: Construction Methods IV</td>
<td>(0,050)</td>
<td>Construction Materials III</td>
</tr>
<tr>
<td>CDL40QT</td>
<td>Construction and Detailing: Construction Materials IV</td>
<td>(0,050)</td>
<td>Construction Materials III</td>
</tr>
<tr>
<td>LWC400T</td>
<td>Law and Contract Management IV*</td>
<td>(0,050)</td>
<td>Office Practice III</td>
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<tr>
<td>OFP400T</td>
<td>Office Practice IV</td>
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<td>Office Practice III</td>
</tr>
<tr>
<td>OFP40PT</td>
<td>Office Practice: Architectural Practice IV</td>
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<td>Office Practice III</td>
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<tr>
<td>OFP40QT</td>
<td>Office Practice: Business Management IV</td>
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<td>Office Practice III</td>
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<td>PJG410T</td>
<td>Project Management IV*</td>
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<td>Office Practice III</td>
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<td>STW400T</td>
<td>Studio Work IV</td>
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<td>Contract Documentation III</td>
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<tr>
<td>STW40PT</td>
<td>Studio Work: Contract Documentation IV</td>
<td>(0,200)</td>
<td>Specification and Quantities III</td>
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<tr>
<td>STW40QT</td>
<td>Studio Work: Specification IV</td>
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</table>

**TOTAL CREDITS FOR THE QUALIFICATION:** 1,000

### 1.4 MAGISTER TECHNOLOGIAE: ARCHITECTURAL TECHNOLOGY

**(Field of specialisation: Technology)**

**(Structured)**

Qualification code: MTAD96

**REMARKS**

a. Admission requirement(s):

A Baccalaureus Technologiae: Architectural Technology or an NQF level 7 bachelor's or honours degree in Architecture obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant's suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Duration:

A minimum of one year and a maximum of three years.

c. Presentation and campus:

Pretoria Campus (day and block-based classes). Please note that the campus indicated is subject to change and confirmation.
d. Accreditation by professional body: This qualification has been accredited by the South African Council for the Architecture Profession (SACAP).
e. Subject credits: Subject credits are shown in brackets after each subject.

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

### YEAR SUBJECTS

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARM500T</td>
<td>Architectural Management V</td>
<td></td>
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</tr>
<tr>
<td>ARM50PT</td>
<td>Architectural Management: Construction Methods V</td>
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<td>Construction and Detailing:</td>
</tr>
<tr>
<td>ARM50QT</td>
<td>Architectural Management: Construction Materials V</td>
<td>(0,200)</td>
<td>Construction and Detailing:</td>
</tr>
<tr>
<td>ATG500T</td>
<td>Research Report: Architectural Technology V</td>
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<td>ATG50PT</td>
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<tr>
<td>ATG50QT</td>
<td>Research Report: Architectural Technology: Technology V</td>
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<tr>
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<td>Research Report: Architectural Technology: Technology V (re-registration)</td>
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</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

### 1.5 SUBJECT INFORMATION

Syllabus content subject to change to accommodate industry changes.

**SUBJECT NAME:** ADVANCED COMPUTER APPLICATIONS IV  
**SUBJECT CODE:** ARA400T  
**EVALUATION METHOD:** CONTINUOUS ASSESSMENT  
**TOTAL TUITION TIME:** Not available  
**OVERVIEW OF SYLLABUS:**
Presentation software such as Art*Lantis, Piranesi, Adobe Photoshop, CorelDRAW. Video editing and multimedia production software. HTML: website design and maintenance.

**SUBJECT NAME:** ADVANCED COMPUTER APPLICATIONS V  
**SUBJECT CODE:** ARA500T  
**EVALUATION METHOD:** CONTINUOUS ASSESSMENT  
**TOTAL TUITION TIME:** Not available  
**OVERVIEW OF SYLLABUS:**
Presentation software such as Art*Lantis, Piranesi, Adobe Photoshop, CorelDRAW. Video editing and multimedia production software. HTML: website design and maintenance.

**SUBJECT NAME:** APPLIED BUILDING SCIENCE I  
**SUBJECT CODE:** ABC100B  
**EVALUATION METHOD:** CONTINUOUS ASSESSMENT  
**TOTAL TUITION TIME:** Not available  
**OVERVIEW OF SYLLABUS:**
SUBJECT NAME: ARCHITECTURAL DESIGN I
SUBJECT CODE: ACH100T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Design projects at a single-storey residential scale with simple circulation and zoning. Spaces around elements and elements in space. Ergonomics: design around human spatial requirements. Structure and material as generators. Introduction to environmental effects on design. The role of context in determining aesthetics.

SUBJECT NAME: ARCHITECTURAL DESIGN II
SUBJECT CODE: ACH200T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Design projects of simple low-rise (double-storey) buildings with more complex circulation requirements, emphasising the following issues:
• Design process: determining design generators, concept, context and concept development
• Structure and material as design generators
• Environment and climate as design generators
• Introduction to problem analysis

SUBJECT NAME: ARCHITECTURAL DESIGN III
SUBJECT CODE: ACH300T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Design projects of simple multi-storey buildings (i.e. offices with a basement), as well as long-span structures (i.e. factories), emphasising the following issues:
• Problem analysis as first step to synthesis
• Interpretation of the brief
• The effects of and solutions to environmental and climatic influences on design
• The principles of sustainability, as applied to buildings
• The fabric of the city: how a design solution acts as building block within the structure and fabric of the city

SUBJECT NAME: ARCHITECTURAL DESIGN IV
SUBJECT CODE: ACH400T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Design projects and exercises to promote creativeness and lateral thinking. Visit to historical towns (Pilgrim's Rest and Dullstroom) with survey and analysis of local buildings, town structure, climate and social structure. This will culminate in an appropriate design proposal, encompassing the generation of a brief for sustainable development. Individual buildings by students will be part of a town-planning exercise carried out collectively in groups. A project utilising structure and material as major generators of design. Design projects consisting of structures with complex circulation and specialised design and/or construction and services (small auditorium, museum, etc.), as well as a mixed-use building, emphasising the following issues: problem analysis, interpretation and development of the brief. Environmental and climatic issues and their influence on design. Sustainability. Urban issues.

SUBJECT NAME: ARCHITECTURAL DESIGN V
SUBJECT CODE: ACH500T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Design exercises pertaining specifically to housing and community in urban and rural context. Community and building visits (precedent studies). Housing design based on mass-production systems and technology. Research paper relating to a specific field of interest.
SUBJECT NAME: ARCHITECTURAL MANAGEMENT: CONSTRUCTION MATERIALS V
SUBJECT CODE: ARM50QT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ARCHITECTURAL MANAGEMENT: CONSTRUCTION METHODS V
SUBJECT CODE: ARM50PT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ARCHITECTURAL PRACTICE III
SUBJECT CODE: AHC300T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Office management (drawing-office practice, forms of collaboration and doing business, strengths and weaknesses, space and equipment requirements and layout). The SAIA Practice Manual (client/architect agreement, accepting work at risk, remuneration for work at risk, styles of practice, multidisciplinary firms, agreement checklist, employment conditions, architect/consultant relationship, project managers, clerk of works, issuing drawings and documentation, the concept of principal agent). The building contract (tender procedures, types of building contracts, forms of subcontractors, dispute resolution, the role of consultants).

SUBJECT NAME: ARCHITECTURAL PRACTICE V
SUBJECT CODE: AHC500T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
The profession: the council and institutes, legislation, scale of fees, copyright of building plans, ethics and professional conduct. Architectural services and duties: pre-project studies, appraisal and definition of the project, design concept, design development, approval and technical documentation, contract administration and inspection, supplementary services. Managing projects and clients: agreements with clients, agreeing on fees, presenting accounts for services rendered, the architect as the client’s principal agent, project programming and familiarisation, directing and reviewing the project, cost-saving techniques, project control and systems, coordination of consultants, keeping in touch, developing client relationships, the second sell. The process of architecture: design and construction documentation, writing effective reports and letters, concept presentation, developing the design, management and documentation, common deficiencies in working drawings, agendas, minutes and meetings. Approvals and applications for relaxation, rezoning and special consent: relationship with statutory authorities, quality of documentation, keeping informed. Post-completion responsibilities: debriefing and job history, the owner’s maintenance manual, as-built drawings, post-occupation user satisfaction surveys.
SUBJECT NAME: ARCHITECTURAL TECHNOLOGY PRACTICE II
SUBJECT CODE: ARC200T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: BUILDING SERVICES III
SUBJECT CODE: BSV300T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: BUSINESS MANAGEMENT V
SUBJECT CODE: BMN500T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Organisational structures: fundamental principles and strategy, partners and philosophy, potential business, strengths and weaknesses, types of organisations, the business plan. Office accommodation: address and locality, space requirements, equipment requirements and layout, image. Office organisation: communications, stationery, library, administrative files, job files. Managing the business: financial planning and budgets, overheads, finance, value-added tax (VAT), PAYE, personal tax, pensions, etc. Insurance, project control and systems, suppliers, employing staff, the unforeseen and the unfortunate, critical management information. Larger companies: communications and structure, specialisation in design, specialisation in marketing, divisionalisation, losing the spice of life. Managing oneself and one's team: self-management, goal setting, team management and leadership, development of individuals. Time management: attitudes, tools, techniques. Marketing and generating new business: essentials of marketing, targeting by sector, building on one's strengths, filling the gaps, being prepared, selling techniques, indirect promotion, building up one's portfolio.

SUBJECT NAME: COMMUNICATION I
SUBJECT CODE: COM150C
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: COMPUTER-AIDED DESIGN II
SUBJECT CODE: CMI200T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
An advanced 3D software package, ArchiCAD and Studio VIZ.

SUBJECT NAME: COMPUTER-AIDED DRAUGHTING I
SUBJECT CODE: CAI110T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
A basic 2D CAD software program; either Caddie or AutoCAD.
SUBJECT NAME: COMPUTER-AIDED DRAUGHTING III
SUBJECT CODE: CAI310T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Photoshop, 3-D animation and moving image technology, namely film and fly throughs.

SUBJECT NAME: COMPUTER-AIDED DRAUGHTING: COMPUTER HARDWARE IV
SUBJECT CODE: CDG40PT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
An overview of all the current important terminology, concepts and basics of computing hardware. Hardware support based on MCSE A+ certification. Software support skills relating to the Windows operating system.

SUBJECT NAME: COMPUTER-AIDED DRAUGHTING: NETWORK SYSTEMS IV
SUBJECT CODE: CDG40QT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: COMPUTER APPLICATIONS I
SUBJECT CODE: COA110B
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
MS Windows, MS Word, MS Excel, CorelDRAW. Basic hardware terminology. Introduction to the Internet and e-mail. Introduction to CAD.

SUBJECT NAME: COMPUTER HARDWARE V
SUBJECT CODE: CHH500T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
An overview of all the current important terminology, concepts and basics of computing hardware. Hardware support based on MCSE A+ certification. Software support skills relating to the Windows operating system.

SUBJECT NAME: CONSTRUCTION AND DETAILING: CONSTRUCTION MATERIALS IV
SUBJECT CODE: CDL40QT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
OVERVIEW OF SYLLABUS:

OVERVIEW OF SYLLABUS:

OVERVIEW OF SYLLABUS:

OVERVIEW OF SYLLABUS:

OVERVIEW OF SYLLABUS:
SUBJECT NAME: CONSTRUCTION MATERIALS V
SUBJECT CODE: CSM500T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONSTRUCTION METHODS I
SUBJECT CODE: KME110T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONSTRUCTION METHODS II
SUBJECT CODE: KME210T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONSTRUCTION METHODS III
SUBJECT CODE: KME310T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
SUBJECT NAME: CONSTRUCTION METHODS IV
SUBJECT CODE: KME400T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONSTRUCTION METHODS V
SUBJECT CODE: KME500T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONTRACT DOCUMENTATION I
SUBJECT CODE: CDO100T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Drawing equipment and materials, lettering, line work and geometric exercises, graphic projections, scale, dimensioning and annotation. Working drawings: ground-floor plan, sections, elevations and site plan, application of the National Building Regulations, services layouts. Construction detailing, measuring existing work, drawing office equipment, storage of information, the role of the architect, technologist and other professional consultants, the building contractor and the client.

SUBJECT NAME: CONTRACT DOCUMENTATION II
SUBJECT CODE: CDO200T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Measured drawings for restoration or for additions. Preparation of drawings for submission and approval by local authorities. Detail drawings for discussion with consultants. Construction detail design drawings. Schedules: finishing, doors, windows, cupboards, etc. Details of components and fixtures. Working drawings, which will be used as contract documents with a bill of quantities, for measuring by a quantity surveyor.

SUBJECT NAME: CONTRACT DOCUMENTATION III
SUBJECT CODE: CDO300T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
No set syllabus, but this subject is based on the design thesis. It is integrated with Construction Methods V and Construction Materials V to produce a complete set of related working drawings.

Introduction and an overview of Western architecture, from the origins to the present day, and Southern African architecture, from the origins to the present day. Principal examples, as well as technological and cultural aspects, are highlighted and put in social context. Visits to local historical examples.


The profession: the council and institutes, legislation, scale of fees, copyright of building plans, ethics and professional conduct. Architectural services and duties: pre-project studies, appraisal and definition of the project, design concept, design development, approval and technical documentation, contract administration and inspection, supplementary services. Managing projects and clients: agreements with clients, agreeing on fees, presenting accounts for services rendered, the architect as the client’s principal agent, project programming and familiarisation, directing and reviewing the project, cost-saving techniques, project control and systems, coordination of consultants, keeping in touch, developing client relationships, the second sell. The process of architecture: design and construction documentation, writing effective reports and letters, concept presentation, developing the design, management and documentation, common deficiencies in working drawings, agendas, minutes and meetings. Approvals and applications for relaxation, rezoning and special consent: relationship with statutory authorities, quality of documentation, remaining informed. Post-completion responsibilities: debriefing and job history, the owner’s maintenance manual, as-built drawings, post-occupation, user satisfaction surveys.
OVERVIEW OF SYLLABUS:
Organisational structures: fundamental principles and strategy, partners and philosophy, potential business, strengths and weaknesses, types of organisations, the business plan. Office accommodation: address and locality, space requirements, equipment requirements and layout, image. Office organisation: communications, stationery, library, administrative files, job files. Managing the business: financial planning and budgets, overheads, finance, value-added tax (VAT), PAYE, personal tax, pensions, etc. Insurance, project control and systems, suppliers, employing staff, the unforeseen and the unfortunate, critical management information. Larger companies: communications and structure, specialisation in design, specialisation in marketing, divisionalisation, losing the spice of life. Managing oneself and one's team: self-management, goal setting, team management and leadership, development of individuals. Time management: attitudes, tools, techniques. Marketing and generating new business: essentials of marketing, targeting by sector, building on one's strengths, filling the gaps, being prepared, selling techniques, indirect promotion, building up a portfolio.

OVERVIEW OF SYLLABUS:

OVERVIEW OF SYLLABUS:
Brief historical overview and shifts in policy. The pre-industrial and early colonial city, the later colonial city, the modernist city, the apartheid city. Elements of cities and urban environments. Empirical rules and principles in urban design. Urban design theories. Sustainability. Urban housing.

OVERVIEW OF SYLLABUS:

OVERVIEW OF SYLLABUS:
Research methodology: scope and nature of the dissertation, administrative procedures, research topics, the problem and its setting, research proposals, applications for funding, research protocols and research planning. Design as a problem-solving process: formulation of design principles, solving conflicting requirements, precedent studies, design thinking and the evaluation of design. Technical structure of a dissertation: format, layout, numbering system, typography, bibliography and referencing.
SUBJECT NAME: RESEARCH REPORT: ARCHITECTURAL TECHNOLOGY: TECHNOLOGY: RESEARCH METHODOLOGY V
SUBJECT CODE: ATG50PT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Research methodology: scope and nature of the dissertation, administrative procedures, research topics, the problem and its setting, research proposals, applications for funding, research protocols and research planning. Technical structure of a dissertation, format, layout, numbering system, typography, bibliography and referencing.

SUBJECT NAME: RESEARCH REPORT: ARCHITECTURAL TECHNOLOGY: TECHNOLOGY: TECHNOLOGY V
SUBJECT CODE: ATG50QT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
The dissertation involves the investigation of a relevant research problem.

SUBJECT NAME: RESEARCH REPORT: ARCHITECTURE: PROFESSIONAL V
SUBJECT CODE: ATG510T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Appraisal and definition: clarifying the problem statement and design objectives, formulating functional relationships, collecting information on the state of the art, formulating requirements and needs. Design concept: searching for conceptual solutions, producing alternative concepts, evaluating alternative solutions, determining the final conceptual form. Building design: producing a refined design, producing alternatives, technical evaluation, selecting the final design for detailed formulation.

SUBJECT NAME: SPECIFICATION V
SUBJECT CODE: SFN500T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: SPECIFICATION AND QUANTITIES III
SUBJECT CODE: SPQ300T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
The following aspects of specification and quantities are covered: introduction to bills, specifications for bills of quantities, interaction between drawings and other contract documentation, as well as estimates, feasibility, measuring units, costing and influencing factors.

SUBJECT NAME: STRUCTURES IV
SUBJECT CODE: STR400T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
SUBJECT NAME:  STUDIO WORK: CONTRACT DOCUMENTATION IV
SUBJECT CODE:  STW40PT
EVALUATION METHOD:  CONTINUOUS ASSESSMENT
TOTAL TUITION TIME:  Not available
OVERVIEW OF SYLLABUS:
No set syllabus, but this subject is based on the design thesis. It is integrated with the subject Construction Methods and Materials to produce a complete set of related working drawings.

SUBJECT NAME:  STUDIO WORK: SPECIFICATION IV
SUBJECT CODE:  STW40QT
EVALUATION METHOD:  CONTINUOUS ASSESSMENT
TOTAL TUITION TIME:  Not available
OVERVIEW OF SYLLABUS:
The purpose and use of specifications, forms of specification, preliminary items and the specification of all building trades.

SUBJECT NAME:  SURVEYING FOR ARCHITECTURE III
SUBJECT CODE:  SFA300T
EVALUATION METHOD:  CONTINUOUS ASSESSMENT
TOTAL TUITION TIME:  Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME:  THEORY OF DESIGN I
SUBJECT CODE:  THD100T
EVALUATION METHOD:  CONTINUOUS ASSESSMENT
TOTAL TUITION TIME:  Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME:  THEORY OF DESIGN II
SUBJECT CODE:  THD200T
EVALUATION METHOD:  CONTINUOUS ASSESSMENT
TOTAL TUITION TIME:  Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME:  THEORY OF DESIGN III
SUBJECT CODE:  THD300T
EVALUATION METHOD:  CONTINUOUS ASSESSMENT
TOTAL TUITION TIME:  Not available
OVERVIEW OF SYLLABUS:
<table>
<thead>
<tr>
<th>SUBJECT NAME:</th>
<th>THEORY OF DESIGN IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUBJECT CODE:</td>
<td>THD400T</td>
</tr>
<tr>
<td>EVALUATION METHOD:</td>
<td>CONTINUOUS ASSESSMENT</td>
</tr>
<tr>
<td>TOTAL TUITION TIME:</td>
<td>Not available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBJECT NAME:</th>
<th>THEORY OF DESIGN V</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUBJECT CODE:</td>
<td>THD500T</td>
</tr>
<tr>
<td>EVALUATION METHOD:</td>
<td>CONTINUOUS ASSESSMENT</td>
</tr>
<tr>
<td>TOTAL TUITION TIME:</td>
<td>Not available</td>
</tr>
<tr>
<td>OVERVIEW OF SYLLABUS:</td>
<td>Weekly seminars dealing with aspects such as social conditions, politics and policies that influence the provision of housing in theory and practice. Participation in Community Planning Forum activities. Research paper relating to a specific field of interest.</td>
</tr>
</tbody>
</table>
2. DEPARTMENT OF BUILDING SCIENCES

2.1 NATIONAL DIPLOMA: BUILDING
Qualification code: NDBU04

REMARKS

a. Admission requirement(s):

For students who obtained a Senior Certificate before 2008:
A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics and an E symbol at the Higher Grade or a D symbol at the Standard Grade for Physical Science.

For students who have obtained a National Senior Certificate since 2008:
A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

b. Recommended subject(s):
None.

c. Selection criteria:
Admission Point Score (APS) and assessment procedures:

Candidates with an APS score of 23+ will be accepted on condition that the marks they obtained in the final school examination (Grade 12 examination) will be the same or higher than the marks used for the conditional selection process. All Applicants will be required to undergo additional assessment (potential assessment) to gain access to the National Diploma. A maximum of 120 new students per year will be admitted.

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 23 (six subjects)

FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 12</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL APS SCORE (six subjects, excluding Life Orientation) 23
d. Minimum duration: Three years.

e. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

f. Intake for this qualification: January and July.

g. Readmission: See Chapter 3 of Students' Rules and Regulations.

h. Experiential Learning I and II: See Chapter 5 of Students' Rules and Regulations. Students are required to provide acceptable proof of employment before registration.

i. Accreditation by professional body: This qualification has been accredited by the Council for Quantity Surveying Profession (SACQSP).

j. Subject groups: Students will be divided into two groups. Subjects from both Subject Group A and Subject Group B must be completed in the allocated time. The grouping of subjects is determined by the Head of the Department to enable students to maintain sufficiently high standards.

k. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks
* Information does not correspond to information in Report 151.
(Deviations approved by the Senate in August 2005.)

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST YEAR

FIRST OR SECOND SEMESTER

SUBJECT GROUP A: MANAGEMENT, APPLIED AND COMMUNICATION (MAC)

The subjects listed below are offered in both semesters. A student may not register for more than three first-time subjects per semester.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC101T</td>
<td>Applied Building Science I</td>
<td>(0,166)*</td>
<td></td>
</tr>
<tr>
<td>CMN101T</td>
<td>Construction Management I</td>
<td>(0,167)</td>
<td></td>
</tr>
<tr>
<td>COM151T</td>
<td>Communication I</td>
<td>(0,083)</td>
<td></td>
</tr>
</tbody>
</table>

SUBJECT GROUP B: TECHNOLOGY, SITE SURVEYING, QUANTITY SURVEYING (TSQ)

The subjects listed below are offered in both semesters. A student may not register for more than five first-time subjects per semester.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COA111C</td>
<td>Computer Applications I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>CTY111T</td>
<td>Construction Technology I</td>
<td>(0,167)</td>
<td></td>
</tr>
<tr>
<td>QSU101T</td>
<td>Quantity Surveying I</td>
<td>(0,167)</td>
<td></td>
</tr>
<tr>
<td>SSU101T</td>
<td>Site Surveying I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSU10XT</td>
<td>Site Surveying: Applications I</td>
<td>(0,084)</td>
<td></td>
</tr>
<tr>
<td>SSU10YT</td>
<td>Site Surveying: Practical I</td>
<td>(0,083)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE FIRST YEAR: 1,000
SECOND YEAR

During the practical year, students must submit a report, in the form of an assignment, on actual experience in each of the following subjects:

- **CMN200T**: Construction Management II (0.166) * Construction Management I
- **CMN201R**: Construction Management II (re-registration) (semester subject)
- **CTY210T**: Construction Technology II (0.167) * Construction Technology I
- **CTY211R**: Construction Technology II (re-registration) (semester subject)
- **QSU210T**: Quantity Surveying II (0.167) * Quantity Surveying I
- **QSU211R**: Quantity Surveying II (re-registration) (semester subject)

Students must compile and maintain a logbook of work completed, which must be certified by the supervisor at the approved employer.

FIRST OR SECOND SEMESTER

- **EXP1BDG**: Experiential Learning I (0.250)
- **EXP2BDG**: Experiential Learning II (0.250) * Experiential Learning I

TOTAL CREDITS FOR THE SECOND YEAR: 1,000

THIRD YEAR

FIRST OR SECOND SEMESTER

SUBJECT GROUP A: MANAGEMENT, ACCOUNTING, CONCRETE AND STRUCTURES

The subjects listed below are offered in both semesters. A student may not register for more than four first-time subjects per semester.

- **CMN301T**: Construction Management III (0.166) * Construction Management II
- **CSA311T**: Construction Accounting III (0.166) *
- **SEK301T**: Structures and Concrete III (0.083) * Structures III
- **SEK30XT**: Structures and Concrete: Applied Building Science I
- **SEK30YT**: Structures and Concrete: Concrete III

SUBJECT GROUP B: TECHNOLOGY, QUANTITY SURVEYING AND PRICE ANALYSIS AND ESTIMATING

The subjects listed below are offered in both semesters. A student may not register for more than three first-time subjects per semester.

- **CTY311T**: Construction Technology III (0.167) * Construction Technology II
- **PAY311T**: Price Analysis and Estimating III (0.167) * Quantity Surveying II
- **QSU311T**: Quantity Surveying III (0.167) * Quantity Surveying II

TOTAL CREDITS FOR THE THIRD YEAR: 1,000
2.2 **BACCALAUREUS TECHNOLOGIAE: CONSTRUCTION MANAGEMENT**

Qualification code: BTCU02

**REMARKS**

a. Admission requirement(s): A National Diploma: Building or an NQF level 6 diploma or bachelor’s degree in Construction Economics obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: All applications are subject to selection.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria campus (day classes). Please note that the campus indicated is subject to change and confirmation.

e. Intake for this qualification: January and July.

f. Readmission: See Chapter 3 of Students’ Rules and Regulations.

g. Accreditation by professional body: This qualification has been accredited by the Council for Quantity Surveying Profession (SACQSP).

h. Subject credits: Subject credits are shown in brackets after each subject.

Key to asterisks

* Information does not correspond to information in Report 151. (Deviations approved by the Senate in August 2005.)

A student may register for a maximum of only three first-time subjects per semester. The subjects presented in each semester will depend on the number of students per group. Subjects are offered in both semesters.

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEP401T</td>
<td>Building Entrepreneurship IV</td>
<td>(0,166)*</td>
</tr>
<tr>
<td>CLP401T</td>
<td>Construction Law and Procedures IV</td>
<td>(0,167)</td>
</tr>
<tr>
<td>CMN411T</td>
<td>Construction Management IV</td>
<td>(0,167)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

**SECOND SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEC401T</td>
<td>Construction Economics IV</td>
<td>(0,166)*</td>
</tr>
<tr>
<td>DLM401T</td>
<td>Development Management IV</td>
<td>(0,167)</td>
</tr>
<tr>
<td>MMG401T</td>
<td>Maintenance Management IV</td>
<td>(0,167)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE QUALIFICATION: 1,000
REMARKS

Please note: This programme will be offered only if there is a sufficient number of students.

a. Admission requirement(s): A Baccalaureus Technologiae: Construction Management or an NQF level 7 bachelor’s or honours degree in Construction Management obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of one year and a maximum of three years.

d. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

e. Subject credits: Subject credits are shown in brackets after each subject.

FIRST OR SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEC501T</td>
<td>Construction Economics V</td>
<td>(0,100)</td>
</tr>
<tr>
<td>CMN511T</td>
<td>Construction Management V</td>
<td>(0,200)</td>
</tr>
<tr>
<td>CRU501T</td>
<td>Research Report: Construction Management V</td>
<td>(0,500)</td>
</tr>
<tr>
<td>CRU501R</td>
<td>Research Report: Construction Management V (re-registration)</td>
<td>(0,000)</td>
</tr>
<tr>
<td>DLM501T</td>
<td>Development Management V</td>
<td>(0,100)</td>
</tr>
<tr>
<td>RMD101H</td>
<td>Research Methodology</td>
<td>(0,100)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

2.4 MAGISTER TECHNOLOGIAE: CONSTRUCTION MANAGEMENT
Qualification code: MTCU95

REMARKS

a. Admission requirement(s): A Baccalaureus Technologiae: Construction Management or an equivalent qualification.

In addition, the student should successfully complete Research Methodology in the first year of study if it was not taken for a previous qualification. Students who have not passed Research Methodology should make arrangements for the attendance of and payment for this subject with Mrs K de Villiers (Building 3-405).
b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of one year and a maximum of three years.

d. Presentation and campus: Pretoria Campus (research).
   Please note that the campus indicated is subject to change and confirmation.

e. Dissertation: This instructional programme comprises a research project with a dissertation. In the dissertation, the student should prove that he or she understands a particular problem in the industry in which he or she has completed research, is able to analyse it and set it out logically to arrive at logical conclusions or a diagnosis, and to make proposals for solutions to the problem or for the elimination of the problem. The dissertation should comply with the usual general technical requirements and rules regarding scope, quality and layout.

f. Subject credits: Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMN510T</td>
<td>Dissertation: Construction Management</td>
<td>(1,000)</td>
</tr>
<tr>
<td>CMN510R</td>
<td>Dissertation: Construction Management (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

2.5 BACCALAUREUS TECHNOLOGiAE: QUANTITY SURVEYING
Qualification code: BTQS02

REMARKS

a. Admission requirement(s): A National Diploma: Building or an NQF level 6 diploma or bachelor’s degree in Construction Economics obtained from a South African university.

   Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications.

   Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

   Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: All applications are subject to selection.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (day classes).
   Please note that the campus indicated is subject to change and confirmation.

e. Intake for this qualification: January and July.

f. Readmission: See Chapter 3 of Students’ Rules and Regulations.
g. Accreditation by professional body: This qualification has been accredited by the Council for Quantity Surveying Profession (SACQSP).

h. Subject credits: Subject credits are shown in brackets after each subject.

Key to asterisks
* Information does not correspond to information in Report 151.
(Deviations approved by the Senate in August 2005.)

A student may register for a maximum of only three first-time subjects per semester. The subjects presented in each semester will depend on the number of students per group. Subjects are offered in both semesters.

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEP401T</td>
<td>Building Entrepreneurship IV</td>
<td>(0,166)*</td>
</tr>
<tr>
<td>CLP401T</td>
<td>Construction Law and Procedures IV</td>
<td>(0,167)</td>
</tr>
<tr>
<td>QSU421T</td>
<td>Quantity Surveying IV</td>
<td>(0,167)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: (0,500)

**SECOND SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEC401T</td>
<td>Construction Economics IV</td>
<td>(0,166)*</td>
</tr>
<tr>
<td>DLM401T</td>
<td>Development Management IV</td>
<td>(0,167)</td>
</tr>
<tr>
<td>MKV401T</td>
<td>Market Valuations IV</td>
<td>(0,167)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: (0,500)

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

### 2.6 MAGISTER TECHNOLOGIAE: QUANTITY SURVEYING (Structured)
Qualification code: MTQSS0

**REMARKS**

Please note: This programme will be offered only if there is a sufficient number of students.

a. Admission requirement(s): A Baccalaureus Technologiae: Quantity Surveying or an NQF level 7 bachelor’s or honours degree in Quantity Surveying obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of one year and a maximum of three years.
d. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

e. Subject credits: Subject credits are shown in brackets after each subject.

**FIRST OR SECOND SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEC501T</td>
<td>Construction Economics V</td>
<td>(0,100)</td>
</tr>
<tr>
<td>DLM501T</td>
<td>Development Management V</td>
<td>(0,100)</td>
</tr>
<tr>
<td>QSU501T</td>
<td>Quantity Surveying V</td>
<td>(0,200)</td>
</tr>
<tr>
<td>QSV501T</td>
<td>Research Report: Quantity Surveying V</td>
<td>(0,500)</td>
</tr>
<tr>
<td>QSV501R</td>
<td>Research Report: Quantity Surveying V (re-registration)</td>
<td>(0,000)</td>
</tr>
<tr>
<td>RMD101H</td>
<td>Research Methodology</td>
<td>(0,100)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE QUALIFICATION:** 1,000

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### 2.7 MAGISTER TECHNOLOGIAE: QUANTITY SURVEYING

Qualification code: MTQS95

**REMARKS**

a. Admission requirement(s): A Baccalaureus Technologiae: Quantity Surveying or an equivalent qualification.

In addition, the student should successfully complete Research Methodology in the first year of study if it was not taken for a previous qualification. Students who have not passed Research Methodology should make arrangements for the attendance of and payment for this subject with Mrs K de Villiers (Building 3-405).

b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of one year and a maximum of three years.

d. Presentation and campus: Pretoria Campus (research). Please note that the campus indicated is subject to change and confirmation.

e. Dissertation: This programme comprises a research project with a dissertation. In the dissertation, the student should prove that he or she understands a particular problem in the industry in which he or she has done research, is able to analyse it and set it out logically to arrive at logical conclusions or a diagnosis, and to make proposals for solutions to the problem or for the elimination of the problem. The dissertation should comply with the usual general technical requirements and rules regarding scope, quality and layout.

f. Subject credits: Subject credits are shown in brackets after each subject.
2.8 SUBJECT INFORMATION

Syllabus content subject to change to accommodate industry changes.

SUBJECT NAME: APPLIED BUILDING SCIENCE I
SUBJECT CODE: ABC101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: BUILDING ENTREPRENEURSHIP IV
SUBJECT CODE: BEP401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: COMMUNICATION I
SUBJECT CODE: COM151T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Communication theory, non-verbal communication (body language). Oral presentations, interviews, developing leadership and participation skills. Technical reports and correspondence.

SUBJECT NAME: COMPUTER APPLICATIONS I
SUBJECT CODE: COA111C
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Components of a microcomputer system, engineering applications of software. Managing personal computers. Introduction to computers. Basics of operating systems. Application programs, such as word-processing and spreadsheet programs.

SUBJECT NAME: CONSTRUCTION ACCOUNTING III
SUBJECT CODE: CSA311T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: CONSTRUCTION ECONOMICS IV
SUBJECT CODE: CEC401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONSTRUCTION ECONOMICS V
SUBJECT CODE: CEC501T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
South African property law and taxation, property and facilities management, asset management, investment in capital projects, financing decisions, dividend decisions, property valuation and development.

SUBJECT NAME: CONSTRUCTION LAW AND PROCEDURES IV
SUBJECT CODE: CLP401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONSTRUCTION MANAGEMENT I
SUBJECT CODE: CMN101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONSTRUCTION MANAGEMENT II
SUBJECT CODE: CMN200T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Introduction to Contract Law and the JBCC Minor Works contract. Projects based on relevant and appropriate site operations, which cover as many of the following topics as possible: legislation and company policy, communication in the micro-environment on the site, coordination of subcontractors, application of management functions and procedures, collection and application of information on plant, drawing up applications of bar charts, labour schedules, material schedules, plant-use schedules, plant maintenance schedules, networks, simple work study exercises. Application of the procurement and completion of materials for a building site.

SUBJECT NAME: CONSTRUCTION MANAGEMENT III
SUBJECT CODE: CMN301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: CONSTRUCTION MANAGEMENT IV
SUBJECT CODE: CMN411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONSTRUCTION MANAGEMENT V
SUBJECT CODE: CMN511T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Introduction to human resource management strategy, environmental issues, affirmative action, human resource development, productivity, creating a strategic organisation, creating a learning organisation. Human resource development and training, strategic industrial relations management, key success factors and measures, implementation of strategies, performance management.

SUBJECT NAME: CONSTRUCTION TECHNOLOGY I
SUBJECT CODE: CTY111T
EVALUATION METHOD: 1 X 4-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Draughtmanship and interpretation of drawings. Substructure and setting out of different types of foundations. Superstructure, i.e. walls, windows, doors. Concrete and timber suspension floors with stairs and railing. Roof construction and coverings. Electrical and plumbing services. Carpentry items, i.e. built-in cupboards, skirtings and ironmongery on fillings. Finishes on walls, floors and ceilings. Materials and properties in the building industry.

SUBJECT NAME: CONSTRUCTION TECHNOLOGY II
SUBJECT CODE: CTY210T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONSTRUCTION TECHNOLOGY III
SUBJECT CODE: CTY311T
EVALUATION METHOD: 1 X 4-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: DEVELOPMENT MANAGEMENT IV
SUBJECT CODE: DLM401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Community development, from informal to fully developed communities. Physical development and its influence on the community. The role of the community in development. Partnership with communities. Community involvement and job creation. The contractor and the community. Guidelines and agreements for labour-intensive projects. Perceptions, expectations and consequences. Appropriate delivery systems, e.g. community trusts, corporations.

SUBJECT NAME: DEVELOPMENT MANAGEMENT V
SUBJECT CODE: DLM501T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
External environment and stakeholders, the logistics concept, strategic approaches to logistics, operations and material flow, elements of a supply chain, in-bound logistics, production requirements through purchasing, the production system, design and productivity, production planning and control, the impact of inventory on production, inventory management, out-bound logistics, operations management in service industries.

SUBJECT NAME: EXPERIENTIAL LEARNING I
SUBJECT CODE: EXP1BDG
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
Students are required to work for six months with approved employers who are –
• building contractors (preferably with MBA or BIA);
• registered quantity surveyors; or
• other employers approved by the Department of Building Sciences as being able to provide students with suitable experiential learning. Students should be given a broad introduction to the building industry, preferably gaining experience of and being exposed to as many of the following aspects as possible:

SUBJECT NAME: EXPERIENTIAL LEARNING II
SUBJECT CODE: EXP2BDG
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
Students are required to work for six months with approved employers who are –
• building contractors (preferably with MBA or BIA);
• registered quantity surveyors; or
• other employers approved by the Department of Building Sciences as being able to provide the students with suitable experiential learning. Students should be given a broad introduction to the building industry, preferably gaining experience of and being exposed to as many of the following aspects as possible:
WITH BUILDERS: Trade skills. Elementary programming. Levelling and setting out. Coordination of all the production activities on site, i.e. labour, ordering materials, handling plant, quality control


SUBJECT NAME: MAINTENANCE MANAGEMENT IV
SUBJECT CODE: MMG401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MARKET VALUATIONS IV
SUBJECT CODE: MKV401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Basic principles, concepts and methods of valuations. Comparative selling and income methods, as well as the cost replacement method. Advantages and disadvantages of those methods and the application of valuation methods. Expropriation.

SUBJECT NAME: PRICE ANALYSIS AND ESTIMATING III
SUBJECT CODE: PAY311T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: QUANTITY SURVEYING I
SUBJECT CODE: QSU101T
EVALUATION METHOD: 1 X 4-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Introduction to the principles, processes and methods of measurement and documentation of builders' work. Drawing up of bills of quantities. Drawing up a list of dimensions. Calculation of quantities. Measurement and description of the following elements of a single-storey building: foundations, including site clearance and simple demolitions, superstructure brickwork, solid floor construction, roofs, finishes, comprising plaster, paint and tiling on walls, conventional floors and plastered and boarded ceilings on bradering. Stock steel, timber and aluminium windows. Stock flush and hard-wood doors, including timber and metal frames. Adjustments for windows, doors and plain openings. Working up by squaring, abstracting and billing.
SUBJECT NAME: QUANTITY SURVEYING II
SUBJECT CODE: QSU210T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Projects based on load-bearing structures, including measuring, abstracting and billing with full descriptions and specifications. Reference to manufacturer catalogues and the ASAQS Model Preambles regarding the following: precast and pre-stressed concrete beams and floors, standard metal doors and windows, standard timber doors and windows, glass, prefabricated timber trusses, roof coverings, eaves, flashing and rainwater goods, floor, wall and ceiling finishes, drainage and plumbing detail, paint. The above projects should be augmented with the following systems when compiling a bill of quantities: traditional method x, computerised method, the use of the model preambles and x preliminaries. The appointment of the members of the professional team and their fee scales. The use of standard forms for certificates.

SUBJECT NAME: QUANTITY SURVEYING III
SUBJECT CODE: QSU311T
EVALUATION METHOD: 1 X 4-HOUR PAPER (PRESCRIBED OPEN BOOK)
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Measurement and description of the following elements of multi-storey buildings: bulk earthworks and site clearance, load-bearing and framed concrete and brick structures, flat roofs, waterproofing to concrete roofs, sheet-metal covering and boarded roofs. Staircases, including balustrade walls, balustrading and finishes. Structural steelwork. Finishes, comprising facings, in-situ terrazzo, patent plaster finishes, more complex tiling, panelling, other non-standard finishes and suspended ceilings. Purpose-made timber and aluminium windows and doors, including sidelights, fanlights and adjustments. Joinery fittings. Plumbing and drainage complete. Prime cost and provisional sums, payment certificates, including final account adjustments and builders’ work regarding specialist installations. Practical working up and drawing up of bills of quantities, complete with trade preambles.

SUBJECT NAME: QUANTITY SURVEYING IV
SUBJECT CODE: QSU421T
EVALUATION METHOD: 2 X 4-HOUR PAPER (PRESCRIBED OPEN BOOK)
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Comprehensive study of the measurement and description of more specialised elements of builders’ work, as well as the procedure for the measurement and documentation of civil engineering work, drawing up of civil engineering bills of quantities and conditions of contract. Computer applications for all of the above.

SUBJECT NAME: QUANTITY SURVEYING V
SUBJECT CODE: QSU501T
EVALUATION METHOD: 2 X 4-HOUR PAPER (PRESCRIBED OPEN BOOK)
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Objectives of project management, planning projects, estimating for control, project organisation, project control. Project management services in the context of a professional quantity surveying practice, construction management, project administration, project monitoring and quality inspection of construction works.

SUBJECT NAME: RESEARCH METHODOLOGY
SUBJECT CODE: RMD101H
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
What does research entail? Research tools, objectives, characteristics, types, the research process, variables and constructs. Research planning and design: planning the project, stating the problem, hypothesis formulation, research proposal, measurement and assessment. Validity and reliability. Data collection and statistical analysis. The research report, hypothesis testing, report formats.
SUBJECT NAME: SITE SURVEYING: APPLICATIONS I
SUBJECT CODE: SSU10XT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: SITE SURVEYING: PRACTICAL I
SUBJECT CODE: SSU10YT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 50 hours
OVERVIEW OF SYLLABUS:
Setting out sites and buildings by means of levelling and elementary tacheometry. Setting out and determining contours. Determining of heights of benchmarks by means of levelling instruments.

SUBJECT NAME: STRUCTURES AND CONCRETE: CONCRETE III
SUBJECT CODE: SEK30YT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: STRUCTURES AND CONCRETE: STRUCTURES III
SUBJECT CODE: SEK30XT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Structures: elementary structural analysis, calculation of sectional properties, shear force and bending moment diagrams of simple supported beams with dead loads, as well as the design of beams in timber and steel. Deflection of simple beams.
3. DEPARTMENT OF CHEMICAL AND METALLURGICAL ENGINEERING

3.1 NATIONAL DIPLOMA: ENGINEERING: CHEMICAL (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)  
(Pending final approval - DoE)  
Qualification code: NDCEF1

REMARKS

a. Admission requirement(s) and selection criteria:

• FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:
  
  Admission requirement(s): A Senior Certificate or an equivalent qualification, with F symbols at the Higher Grade or E symbols at the Standard Grade for English, Mathematics and Physical Science.

  Recommended subject(s): None.

  Selection criteria: Prospective students who meet the above requirements will sit for an admission test. Admission to either the formal qualification or a preparation programme is determined by a combination of the results of the admission test and the Senior Certificate marks. The offer to a prospective student of a place expires six months after the date on which the admission test is written.

• FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:
  See qualification NDCE03.

b. Minimum duration: Four years.

c. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

d. Class attendance: Subjects are offered on location (Soshanguve South, Arcadia or Pretoria campuses) as determined by the Head of the Department.

e. Intake for the qualification: July only.


g. Practicals: It is compulsory for students to attend 100% of the practical sessions. Students must pass the practical component of a subject to be admitted to the examination.

h. Safety wear: Students are required to wear laboratory coats and other applicable protective gear during practicals. Students must purchase safety equipment and clothing themselves.

i. Textbooks: Additional textbooks and other educational material will be required.

j. Experiential Learning I and II: See Chapter 5 of the Students’ Rules and Regulations.

k. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.
SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPACA01</td>
<td>Foundation Academic Skills</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>FPAPP01</td>
<td>Foundation Applied Science</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>FPEGI01</td>
<td>Foundation Engineering</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>FPMAT05</td>
<td>Foundation Mathematics</td>
<td>(0,050)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,250

SECOND SEMESTER

After completing all of the above subjects.

<table>
<thead>
<tr>
<th>Subject</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE151B Chemistry IA</td>
<td>(0,100)</td>
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</tr>
<tr>
<td>COS151T Communication Skills I</td>
<td>(0,050)</td>
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</tr>
<tr>
<td>CSK101B Computer Skills I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>MAT181T Mathematics I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>PHU161B Physics IA</td>
<td>(0,100)</td>
<td></td>
</tr>
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</table>

TOTAL CREDITS FOR THE SEMESTER: 0,433

TOTAL CREDITS FOR THE FIRST YEAR: 0,683

SECOND YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>Subject</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CET211T Chemical Engineering Technology II</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>CET21XT Chemical Engineering Technology: Chemical Principles II</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>DCE111T Drawing: Chemical Engineering I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>EPH201T Engineering Physics II</td>
<td>(0,100)</td>
<td>Physics IA</td>
</tr>
<tr>
<td>MAT271T Mathematics II</td>
<td>(0,083)</td>
<td>Mathematics I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,333

SECOND SEMESTER

<table>
<thead>
<tr>
<th>Subject</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CET211T Chemical Engineering Technology II</td>
<td>(0,068)</td>
<td></td>
</tr>
<tr>
<td>CET21YT Chemical Engineering Technology: Chemical Principles II</td>
<td>(0,068)</td>
<td></td>
</tr>
<tr>
<td>ICH231T Inorganic Chemistry II</td>
<td>(0,083)</td>
<td>Chemistry IA</td>
</tr>
<tr>
<td>OCH221T Organic Chemistry II</td>
<td>(0,083)</td>
<td>Chemistry IA</td>
</tr>
<tr>
<td>PCB221T Physical Chemistry II</td>
<td>(0,083)</td>
<td>Chemistry IA</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,317

TOTAL CREDITS FOR THE SECOND YEAR: 0,650

CHEMICAL AND METALLURGICAL ENGINEERING
THIRD YEAR

FIRST SEMESTER

CET33AT  Chemical Engineering Technology IIIA  (0,100)  Chemical Engineering Technology II
CMP33AT  Chemical Plant IIIA  (0,083)  Inorganic Chemistry II
CPI201T  Chemical Process Industries II  (0,083)  Organic Chemistry II
                       Physical Chemistry II
MSK121T  Management Skills I  (0,136)
TCE301T  Thermodynamics: Chemical Engineering III  (0,083)  Physical Chemistry II

TOTAL CREDITS FOR THE SEMESTER: 0,485

SECOND SEMESTER

CET33BT  Chemical Engineering Technology IIIB  (0,100)  Chemical Engineering Technology IIIA
CMP33BT  Chemical Plant IIIB  (0,083)  Chemical Process Industries II
CPP301T  Chemical Process Design: Principles III  (0,083)  Drawing: Chemical Engineering I
                        Mathematics II
PCT301T  Process Control III  (0,083)  Thermodynamics: Chemical Engineering III
TDA301T  Thermodynamics: Applied III  (0,083)

The subject below is not compulsory for obtaining the National Diploma. However, the Department strongly recommends that students take this subject to prepare and equip them for the labour market.

EPS101T  Entrepreneurial Skills  (0,000)

TOTAL CREDITS FOR THE SEMESTER: 0,432

TOTAL CREDITS FOR THE THIRD YEAR: 0,917

FOURTH YEAR

FIRST SEMESTER

EXP1ECH  Experiential Learning I  (0,375)

TOTAL CREDITS FOR THE SEMESTER: 0,375

SECOND SEMESTER

EXP2ECH  Experiential Learning II  (0,375)  Experiential Learning I

TOTAL CREDITS FOR THE SEMESTER: 0,375

TOTAL CREDITS FOR THE FOURTH YEAR: 0,750
3.2 NATIONAL DIPLOMA: ENGINEERING: CHEMICAL (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)
(Pending final approval - Senate)
Qualification code: NDCEF0

NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2009. STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL 2014 TO OBTAIN IT, SUBJECT TO THE STIPULATIONS OF REGULATION 3.1.1 ON THE MAXIMUM DURATION OF STUDY.

Phase-out date: 31 December 2014

Presentation and Campus:
Pretoria Campus (day classes).
Please note that the campus indicated is subject to change and confirmation.

Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CET201T</td>
<td>Chemical Engineering Technology II</td>
<td></td>
</tr>
<tr>
<td>FPCET01</td>
<td>Foundation Chemical Engineering</td>
<td>(0,050)</td>
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<tr>
<td></td>
<td>Technology: Chemical Principles II</td>
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<tr>
<td>FPCHE03</td>
<td>Foundation Chemistry IA</td>
<td>(0,133)</td>
</tr>
<tr>
<td>FPCOS02</td>
<td>Foundation Communication Skills I</td>
<td>(0,043)</td>
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<td>FPCSK02</td>
<td>Foundation Computer Skills I</td>
<td>(0,083)</td>
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<td>FPDCE01</td>
<td>Foundation Drawing: Chemical Engineering I</td>
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<td>FPMAT04</td>
<td>Foundation Mathematics I</td>
<td>(0,083)</td>
</tr>
<tr>
<td>FPPHU03</td>
<td>Foundation Physics IA</td>
<td>(0,133)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE FIRST YEAR: 0,633

As from the second year, students will continue with the subjects of the second semester of the qualification NDCE03. Students will still register for the qualification code NDCEF0. Students will not be permitted to continue with the subjects of the second semester of the first year if all the subjects of the foundation year have not been passed.

3.3 NATIONAL DIPLOMA: ENGINEERING: CHEMICAL
Qualification code: NDCE03

REMARKS

a. Admission requirement(s):
   For students who obtained a Senior Certificate before 2008: A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics and an E symbol at the Higher Grade or a D symbol at the Standard Grade for Physical Science.
   For students who have obtained a National Senior Certificate since 2008: A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

b. Recommended subject(s): None.
c. Selection criteria: Admission Point Score (APS) and assessment procedures:

Candidates with an APS score of 24+ will be admitted to the National Diploma or the National Diploma (Extended Curriculum). A candidate’s performance in an academic placement test written in January as part of the Faculty’s orientation programme will determine whether he or she will be channelled to the National Diploma or National Diploma (Extended Curriculum).

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
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<tbody>
<tr>
<td>7</td>
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</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
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<tr>
<td>3</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)

FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
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</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
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</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
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<tr>
<td>Mathematics</td>
<td>4</td>
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<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
<tr>
<td>TOTAL APS SCORE (six subjects, excluding Life Orientation)</td>
<td>24</td>
</tr>
</tbody>
</table>

d. Minimum duration: Three years.

e. Presentation and campus: Pretoria Campus (day classes).

Please note that the campus indicated is subject to change and confirmation.

f. Class attendance: Subjects are offered on location (Soshanguve South, Arcadia or Pretoria campuses) as determined by the Head of the Department.

g. Intake for the qualification: January only.

h. Readmission: See Chapter 3 of the Students’ Rules and Regulations.

i. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

j. Practicals: It is compulsory for students to attend 100% of the practical sessions. Students must pass the practical component of a subject to be admitted to the examination.
k. Safety wear: Students are required to wear laboratory coats and other applicable protective gear during practicals. Students must purchase safety equipment and clothing themselves.

l. Textbooks: Additional textbooks and other educational material will be required.

m. Experiential Learning I and II: See Chapter 5 of the Students’ Rules and Regulations.

n. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks:
* Information does not correspond to information in Report 151.
       (Deviations approved by the Senate in August 2005.)

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CET201T</td>
<td>Chemical Engineering Technology II</td>
<td></td>
<td></td>
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<tr>
<td>CET20XT</td>
<td>Chemical Engineering Technology:</td>
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<tr>
<td></td>
<td>Chemical Principles II</td>
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<td>CHE141B</td>
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<td>Chemistry IA</td>
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<td></td>
<td>COS101T</td>
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<tr>
<td></td>
<td>Communication Skills I</td>
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<tr>
<td></td>
<td>CSK101B</td>
<td>(0,083)</td>
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<tr>
<td></td>
<td>Computer Skills I</td>
<td></td>
<td></td>
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<td>DCE111T</td>
<td>(0,108)</td>
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<td></td>
<td>Drawing: Chemical Engineering I</td>
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<tr>
<td></td>
<td>MAT171T</td>
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<td>Mathematics I</td>
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<td>PHU161B</td>
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<td>Physics IA</td>
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TOTAL CREDITS FOR THE SEMESTER: 0,633

SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CET201T</td>
<td>Chemical Engineering Technology II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CET20YT</td>
<td>Chemical Engineering Technology:</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metallurgical Principles II</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EPH201T</td>
<td>(0,068)</td>
<td>Chemical Engineering Technology:</td>
</tr>
<tr>
<td></td>
<td>Engineering Physics II</td>
<td></td>
<td>Chemical Principles II or Foundation Chemical Engineering Technology:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chemistry IA or Foundation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chemistry IA</td>
</tr>
<tr>
<td></td>
<td>ICH231T</td>
<td>(0,083)</td>
<td>Chemistry IA or Foundation</td>
</tr>
<tr>
<td></td>
<td>Inorganic Chemistry II</td>
<td></td>
<td>Chemistry IA</td>
</tr>
<tr>
<td></td>
<td>MAT271T</td>
<td>(0,083)</td>
<td>Mathematics I or Foundation</td>
</tr>
<tr>
<td></td>
<td>Mathematics II</td>
<td></td>
<td>Mathematics I</td>
</tr>
<tr>
<td></td>
<td>OCH221T</td>
<td>(0,083)</td>
<td>Chemistry IA or Foundation</td>
</tr>
<tr>
<td></td>
<td>Organic Chemistry II</td>
<td></td>
<td>Chemistry IA</td>
</tr>
<tr>
<td></td>
<td>PCB221T</td>
<td>(0,083)</td>
<td>Chemistry IA or Foundation</td>
</tr>
<tr>
<td></td>
<td>Physical Chemistry II</td>
<td></td>
<td>Chemistry IA</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,450

TOTAL CREDITS FOR THE FIRST YEAR: 1,083
SECOND YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CET33AT</td>
<td>Chemical Engineering Technology IIIA</td>
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<td>CMP33AT</td>
<td>Chemical Plant IIIA</td>
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</tr>
<tr>
<td>CPI201T</td>
<td>Chemical Process Industries II</td>
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</tr>
<tr>
<td>MSK121T</td>
<td>Management Skills I</td>
<td>0.136</td>
</tr>
<tr>
<td>TCE301T</td>
<td>Thermodynamics: Chemical Engineering III</td>
<td>0.083</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.485

SECOND SEMESTER

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CET33BT</td>
<td>Chemical Engineering Technology IIIB</td>
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<tr>
<td>CMP33BT</td>
<td>Chemical Plant IIIB</td>
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</tr>
<tr>
<td>CPP301T</td>
<td>Chemical Process Design: Principles III</td>
<td>0.083</td>
</tr>
<tr>
<td>PCT301T</td>
<td>Process Control III</td>
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<tr>
<td>TDA301T</td>
<td>Thermodynamics: Applied III</td>
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</tr>
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**TOTAL CREDITS FOR THE SEMESTER:** 0.432

**TOTAL CREDITS FOR THE SECOND YEAR:** 0.917

THIRD YEAR

FIRST OR SECOND SEMESTER

<table>
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<th>Credits</th>
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<tbody>
<tr>
<td>EXP1ECH</td>
<td>Experiential Learning I</td>
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<tr>
<td>EXP2ECH</td>
<td>Experiential Learning II</td>
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</table>

**TOTAL CREDITS FOR THE THIRD YEAR:** 1.000

3.4 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CHEMICAL
Qualification code: BTCE02

REMARKS

a. Admission requirement(s): A National Diploma: Engineering: Chemical with Stage Separation or an NQF level 6 bachelor’s degree in Chemical Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications.
Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme. Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Admission is subject to selection.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.


g. Practicals: It is compulsory for students to attend 100% of the practical sessions. Students must pass the practical component of a subject to be admitted to the examination.

h. Safety wear: Students are required to wear laboratory coats and other applicable protective gear during practicals. Students must purchase safety equipment and clothing themselves.

i. Textbooks: Additional textbooks and other educational material will be required.

j. Subject credits: Subject credits are shown in brackets after each subject.

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
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<tbody>
<tr>
<td>CET401T</td>
<td>Chemical Engineering Technology IV</td>
<td>(0,100)</td>
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<tr>
<td>CET40YT</td>
<td>Chemical Engineering Technology: Heat and Mass Transfer IV</td>
<td>(0,100)</td>
</tr>
<tr>
<td>CET40ZT</td>
<td>Chemical Engineering Technology: Unit Operations IV</td>
<td>(0,100)</td>
</tr>
<tr>
<td>CPD401T</td>
<td>Chemical Process Design IV</td>
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</tr>
<tr>
<td>CPD40XT</td>
<td>Chemical Process Design: Equipment Design IV</td>
<td>(0,100)</td>
</tr>
<tr>
<td>MTE301T</td>
<td>Mathematics: Chemical Engineering III</td>
<td>(0,100)</td>
</tr>
<tr>
<td>PJC401T</td>
<td>Project: Chemical Engineering IV (offered in both semesters)</td>
<td>(0,100)</td>
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<tr>
<td>PJC401R</td>
<td>Project: Chemical Engineering IV (re-registration)</td>
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<tr>
<td>REA401T</td>
<td>Reactor Technology IV</td>
<td>(0,100)</td>
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</table>

TOTAL CREDITS FOR THE SEMESTER: 0,600
SECOND SEMESTER

CET401T Chemical Engineering Technology IV
CET40XT Chemical Engineering Technology: Fluid Flow IV
CPD401T Chemical Process Design IV
CPD40YT Chemical Process Design: Plant Design IV
PCI401T Production Engineering: Chemical Industry IV
PCT401B Process Control IV

TOTAL CREDITS FOR THE SEMESTER: 0,400
TOTAL CREDITS FOR THE QUALIFICATION: 1,000

3.5 MAGISTER TECHNOLOGIAE: ENGINEERING: CHEMICAL
Qualification code: MTCE95

REMARKS

a. Admission requirement(s): A Baccalaureus Technologiae: Engineering: Chemical degree or an NQF level 7 bachelor’s or honours degree in Chemical Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Selection criteria: A personal interview with a departmental selection panel.

c. Duration: A minimum of one year and a maximum of three years.

d. Presentation and campus: Pretoria Campus (research).

Please note that the campus indicated is subject to change and confirmation.

e. Structure: The qualification consists of a research project that must be recorded in the form of a dissertation.

f. Re-registration: Students must re-register for this qualification every year.

g. Subject credits: Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECH500T</td>
<td>Dissertation: Engineering: Chemical</td>
<td>(1,000)</td>
</tr>
<tr>
<td>ECH500R</td>
<td>Dissertation: Engineering: Chemical (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000
3.6 DOCTOR TECHNOLOGIAE: ENGINEERING: CHEMICAL
Qualification code: DTCE96

REMARKS

a. Admission requirement(s): A Magister Technologiae: Engineering: Chemical or an NQF level 8 master’s degree in Chemical Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign master’s degree may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualification by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Selection criteria: A personal interview with a departmental selection panel.

c. Duration: A minimum of two years and a maximum of five years.

d. Presentation and campus: Pretoria Campus (research). Please note that the campus indicated is subject to change and confirmation.

e. Structure: The qualification consists of a research project that must be recorded in the form of a thesis.

f. Re-registration: Students must re-register for this qualification every year.

g. Subject credits: Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECH700T</td>
<td>Thesis: Engineering: Chemical</td>
<td>(2,000)</td>
</tr>
<tr>
<td>ECH700R</td>
<td>Thesis: Engineering: Chemical</td>
<td>(0,000)</td>
</tr>
<tr>
<td></td>
<td>(re-registration)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 2,000

3.7 NATIONAL DIPLOMA: ENGINEERING: METALLURGY (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)
(Pending final approval - DoE)
Qualification code: NDMYF1

REMARKS

a. Admission requirement(s) and selection criteria:

- FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

  Admission requirement(s): A Senior Certificate or an equivalent qualification, with F symbols at the Higher Grade or E symbols at the Standard Grade for English, Mathematics and Physical Science.

  Recommended subject(s): None.
Selection criteria: Prospective students who meet the above requirements, will sit for an admission test. Admission to either the formal qualification or a preparation programme is determined by a combination of the results of the admission test and the Senior Certificate marks. The offer to a prospective student of a place expires six months after the date on which the admission test is written.

- **FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:**
  
  See qualification NDMY03.

  b. Minimum duration: Four years.
  
  c. Presentation and campus: Pretoria Campus (day classes).
     Please note that the campus indicated is subject to change and confirmation.
  
  d. Class attendance: Subjects are offered on location (Soshanguve South, Arcadia or Pretoria campuses) as determined by the Head of the Department.
  
  e. Intake for the qualification: January only.
  
  
  g. Practicals: It is compulsory for students to attend 100% of the practicals. Students must pass the practical component of a subject to be admitted to the examination.
  
  h. Safety wear: Students are required to wear laboratory coats and other applicable protective gear during practicals. Students must purchase safety equipment and clothing themselves.
  
  i. Textbooks: Additional textbooks and other educational material will be required.
  
  j. Experiential Learning I and II: See Chapter 5 of the Students’ Rules and Regulations.
  
  k. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

**SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES**

**FIRST YEAR**

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPACA01</td>
<td>Foundation Academic Skills</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>FPAPP01</td>
<td>Foundation Applied Science</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>FPEGI01</td>
<td>Foundation Engineering</td>
<td>(0,050)</td>
<td></td>
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<tr>
<td>FPMAT05</td>
<td>Foundation Mathematics</td>
<td>(0,050)</td>
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TOTAL CREDITS FOR THE SEMESTER: 0,250

**SECOND SEMESTER**

After completing all of the above subjects.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>CHE151B</td>
<td>Chemistry IA</td>
<td>(0,100)</td>
</tr>
<tr>
<td>COS151T</td>
<td>Communication Skills I</td>
<td>(0,050)</td>
</tr>
<tr>
<td>CSK101B</td>
<td>Computer Skills I</td>
<td>(0,083)</td>
</tr>
<tr>
<td>MAT181T</td>
<td>Mathematics I</td>
<td>(0,100)</td>
</tr>
<tr>
<td>PHU161B</td>
<td>Physics IA</td>
<td>(0,100)</td>
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TOTAL CREDITS FOR THE SEMESTER: 0,433

TOTAL CREDITS FOR THE FIRST YEAR: 0,683
### SECOND YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0,080)</td>
</tr>
<tr>
<td>MDR101C</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0,080)</td>
</tr>
<tr>
<td>MNP211T</td>
<td><strong>Mineral Processing II</strong></td>
<td></td>
</tr>
<tr>
<td>MNP21XT</td>
<td>Mineral Processing: Chemical Principles II</td>
<td>(0,050)</td>
</tr>
<tr>
<td>PML101T</td>
<td>Physical Metallurgy I</td>
<td>(0,085)</td>
</tr>
<tr>
<td>SMM201T</td>
<td>Strength of Materials II</td>
<td>(0,083)</td>
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TOTAL CREDITS FOR THE SEMESTER: 0,378

#### SECOND SEMESTER

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MNP201T</td>
<td><strong>Mineral Processing II</strong></td>
<td></td>
</tr>
<tr>
<td>MNP21YT</td>
<td>Mineral Processing: Metallurgical Principles II</td>
<td>(0,050)</td>
</tr>
<tr>
<td>MCI201T</td>
<td>Metallurgical Chemistry II</td>
<td>(0,083)</td>
</tr>
<tr>
<td>MSK121T</td>
<td>Management Skills I</td>
<td>(0,083)</td>
</tr>
<tr>
<td>RFC201T</td>
<td>Refractories II</td>
<td>(0,083)</td>
</tr>
</tbody>
</table>

The subject below is not compulsory for obtaining the National Diploma. However, the Department strongly recommends that students take this subject to prepare and equip them for the labour market.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MTE301T</td>
<td>Mathematics: Chemical Engineering III</td>
<td>(0,000)</td>
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TOTAL CREDITS FOR THE SEMESTER: 0,299

TOTAL CREDITS FOR THE SECOND YEAR: 0,677

#### THIRD YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ANP201T</td>
<td>Applied Mineral Processing II</td>
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<tr>
<td>ENF201T</td>
<td>Extraction of Non-Ferrous Metals II</td>
<td>(0,080)</td>
</tr>
<tr>
<td>FAT201T</td>
<td>Ferro-Alloy Technology II</td>
<td>(0,080)</td>
</tr>
<tr>
<td>MGH201T</td>
<td>Metallurgical Thermodynamics II</td>
<td>(0,080)</td>
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<tr>
<td>PMU201T</td>
<td>Practical Metallurgy II</td>
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TOTAL CREDITS FOR THE SEMESTER: 0,400

#### SECOND SEMESTER

<table>
<thead>
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<tbody>
<tr>
<td>ANP301T</td>
<td>Applied Mineral Processing III</td>
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<td>CRS301T</td>
<td>Corrosion III</td>
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</tr>
<tr>
<td>ENF311T</td>
<td>Extraction of Non-Ferrous Metals III</td>
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<tr>
<td>EPS101T</td>
<td>Entrepreneurial Skills</td>
<td>(0,070)</td>
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<tr>
<td>FAT311T</td>
<td>Ferro-Alloy Technology III</td>
<td>(0,070)</td>
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<tr>
<td>QCL221T</td>
<td>Quality Control II</td>
<td>(0,070)</td>
</tr>
<tr>
<td>RFC321T</td>
<td>Refractories III</td>
<td>(0,070)</td>
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</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 8,677
The subject below is not compulsory for obtaining the National Diploma. However, the Department strongly recommends that students take this subject to prepare and equip them for the labour market.

GEO141T Geology I (0,000)

TOTAL CREDITS FOR THE SEMESTER: 0,490
TOTAL CREDITS FOR THE THIRD YEAR: 0,890

FOURTH YEAR

FIRST SEMESTER

EXP1MET Experiential Learning I (0,375)

TOTAL CREDITS FOR THE SEMESTER: 0,375

SECOND SEMESTER

EXP2MET Experiential Learning II (0,375) Experiential Learning I

TOTAL CREDITS FOR THE SEMESTER: 0,375
TOTAL CREDITS FOR THE FOURTH YEAR: 0,750

3.8 NATIONAL DIPLOMA: ENGINEERING: METALLURGY (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)
(Pending final approval - Senate)
Qualification code: NDMYF0

NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2009. STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL 2014 TO OBTAIN IT, SUBJECT TO THE STIPULATIONS OF REGULATION 3.1.1 ON THE MAXIMUM DURATION OF STUDY.

Phase-out date: 31 December 2014

Presentation and Campus:
Pretoria Campus (day classes).
Please note that the campus indicated is subject to change and confirmation.

Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPCHE03</td>
<td>Foundation Chemistry IA</td>
<td>(0,083)</td>
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<tr>
<td>FPCOS02</td>
<td>Foundation Communication Skills I</td>
<td>(0,044)</td>
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<tr>
<td>FPCSK02</td>
<td>Foundation Computer Skills I</td>
<td>(0,044)</td>
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<tr>
<td>FPMAT04</td>
<td>Foundation Mathematics I</td>
<td>(0,083)</td>
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<tr>
<td>FPMDR01</td>
<td>Foundation Mechanical Engineering Drawing I</td>
<td>(0,083)</td>
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<tr>
<td>FPMEY01</td>
<td>Foundation Metallurgy I</td>
<td>(0,067)</td>
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</tr>
<tr>
<td>MNP201T</td>
<td>Mineral Processing II</td>
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<td></td>
</tr>
<tr>
<td>FPMNP01</td>
<td>Foundation Mineral Processing: Chemical Principles II</td>
<td>(0,045)</td>
<td></td>
</tr>
<tr>
<td>FPPHU03</td>
<td>Foundation Physics IA</td>
<td>(0,068)</td>
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</tbody>
</table>

TOTAL CREDITS FOR THE FIRST YEAR: 0,517
### SECOND YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MCI201T</td>
<td>Metallurgical Chemistry II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MNP201T</td>
<td>Mineral Processing II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MNP20YT</td>
<td>Mineral Processing: Metallurgical Principles II</td>
<td>(0.042)</td>
</tr>
<tr>
<td>PML101T</td>
<td>Physical Metallurgy I</td>
<td>(0.083)</td>
</tr>
<tr>
<td>SMM201T</td>
<td>Strength of Materials II</td>
<td>(0.083)</td>
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**plus one of the following subjects:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Description</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EPS101T</td>
<td>Entrepreneurial Skills</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MSK121T</td>
<td>Management Skills I</td>
<td>(0.083)</td>
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**TOTAL CREDITS FOR THE SEMESTER:** 0.457

#### SECOND SEMESTER

<table>
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<tbody>
<tr>
<td>ANP201T</td>
<td>Applied Mineral Processing II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>ENF201T</td>
<td>Extraction of Non-Ferrous Metals II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>FAT201T</td>
<td>Ferro-Alloy Technology II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MGH201T</td>
<td>Metallurgical Thermodynamics II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>PMU201T</td>
<td>Practical Metallurgy II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>RFC201T</td>
<td>Refractories II</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.498

The subject below is not compulsory for obtaining the National Diploma. However, the Department strongly recommends that students take this subject to prepare and equip them for the labour market.

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTE301T</td>
<td>Mathematics: Chemical Engineering III</td>
<td>(0.000)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SECOND YEAR:** 0.955

### THIRD YEAR

#### After completion of all the subjects in the first year.

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANP301T</td>
<td>Applied Mineral Processing III</td>
<td>(0.088)</td>
</tr>
<tr>
<td>CRS301T</td>
<td>Corrosion III</td>
<td>(0.088)</td>
</tr>
<tr>
<td>ENF311T</td>
<td>Extraction of Non-Ferrous Metals III</td>
<td>(0.088)</td>
</tr>
<tr>
<td>FAT311T</td>
<td>Ferro-Alloy Technology III</td>
<td>(0.088)</td>
</tr>
<tr>
<td>QCL221T</td>
<td>Quality Control II</td>
<td>(0.088)</td>
</tr>
<tr>
<td>RFC321T</td>
<td>Refractories III</td>
<td>(0.088)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.528

The subject below is not compulsory for obtaining the National Diploma. However, the Department strongly recommends that students take this subject to prepare and equip them for the labour market.

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO141T</td>
<td>Geology I</td>
<td>(0.000)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.528
SECOND SEMESTER
EXP1MET Experiential Learning I (0,500)
TOTAL CREDITS FOR THE SEMESTER: 0,500
TOTAL CREDITS FOR THE THIRD YEAR: 1,028

FOURTH YEAR

FIRST SEMESTER
EXP2MET Experiential Learning II (0,500) Experiential Learning I
TOTAL CREDITS FOR THE SEMESTER: 0,500
TOTAL CREDITS FOR THE FOURTH YEAR: 0,500

3.9 NATIONAL DIPLOMA: ENGINEERING: METALLURGY
Qualification code: NDMY03

REMARKS

a. Admission requirement(s): For students who obtained a Senior Certificate before 2008: A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics and an E symbol at the Higher Grade or a D symbol at the Standard Grade for Physical Science. For students who have obtained a National Senior Certificate since 2008: A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

b. Recommended subject(s): None.

c. Selection criteria: Admission Point Score (APS) and assessment procedures:
Candidates with an APS score of 24+ will be admitted to the National Diploma or the National Diploma (Extended Curriculum). A candidate’s performance in an academic placement test written in January as part of the Faculty’s orientation programme will determine whether he or she will be channelled to the National Diploma or National Diploma (Extended Curriculum).

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)
FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
<tr>
<td>TOTAL APS SCORE (six subjects, excluding Life Orientation)</td>
<td>24</td>
</tr>
</tbody>
</table>

d. Minimum duration: Three years.

e. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

f. Class attendance: Subjects are offered on location (Soshanguve South, Arcadia or Pretoria campuses) as determined by the Head of the Department.

g. Intake for the qualification: January only.

h. Readmission: See Chapter 3 of the Students’ Rules and Regulations.

i. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

j. Practicals: It is compulsory for students to attend 100% of the practicals. Students must pass the practical component of a subject to be admitted to the examination.

k. Safety wear: Students are required to wear laboratory coats and other applicable protective gear during practicals. Students must purchase safety equipment and clothing themselves.

l. Textbooks: Additional textbooks and other educational material will be required.

m. Experiential Learning I and II: See Chapter 5 of the Students’ Rules and Regulations.

n. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks:
* Information does not correspond to information in Report 151. (Deviations approved by the Senate in August 2005 and November 2008.)
** Students may choose to take Management Skills I or Entrepreneurial Skills I.
SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE141B</td>
<td>Chemistry IA</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>CSK101B</td>
<td>Computer Skills I</td>
<td>(0.042)</td>
<td></td>
</tr>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>MEY101T</td>
<td>Metallurgy I</td>
<td>(0.084)</td>
<td></td>
</tr>
<tr>
<td>MNP201T</td>
<td>Mineral Processing II</td>
<td>(0.041)</td>
<td></td>
</tr>
<tr>
<td>MNP20XT</td>
<td>Mineral Processing: Chemical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Principles II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHU161B</td>
<td>Physics IA</td>
<td>(0.083)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.416

SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COS101T</td>
<td>Communication Skills I</td>
<td>(0.042)</td>
<td></td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0.083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MCI201T</td>
<td>Metallurgical Chemistry II</td>
<td>(0.083)</td>
<td>Chemistry IA</td>
</tr>
<tr>
<td>MDR101C</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>MNP201T</td>
<td>Mineral Processing II</td>
<td>(0.042)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Principles II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PML101T</td>
<td>Physical Metallurgy I</td>
<td>(0.085)</td>
<td>Metallurgy I</td>
</tr>
<tr>
<td>SMM201T</td>
<td>Strength of Materials II</td>
<td>(0.083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Physics IA</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.501

TOTAL CREDITS FOR THE FIRST YEAR: 0.917

SECOND YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANP201T</td>
<td>Applied Mineral Processing II</td>
<td>(0.068)*</td>
<td>Metallurgical Chemistry</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Metallurgy I</td>
</tr>
<tr>
<td>ENF201T</td>
<td>Extraction of Non-Ferrous Metals</td>
<td>(0.067)*</td>
<td>Metallurgical Chemistry</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td></td>
<td>II</td>
</tr>
<tr>
<td>FAT201T</td>
<td>Ferro-Alloy Technology II</td>
<td>(0.067)*</td>
<td>Physical Metallurgy I</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MGH201T</td>
<td>Metallurgical Thermodynamics II</td>
<td>(0.068)*</td>
<td>Metallurgical Chemistry</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td></td>
<td>II</td>
</tr>
<tr>
<td>MSK121T</td>
<td>Management Skills I**</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>PMU201T</td>
<td>Practical Metallurgy II</td>
<td>(0.080)*</td>
<td>Metallurgy I</td>
</tr>
<tr>
<td>RFC201T</td>
<td>Refractories II</td>
<td>(0.067)*</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.500

The subject below is not compulsory for obtaining the National Diploma. However, the Department strongly recommends that students take this subject to prepare and equip them for the labour market.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTE301T</td>
<td>Mathematics: Chemical Engineering III*</td>
<td>(0.000)</td>
<td>Mathematics II</td>
</tr>
</tbody>
</table>

CHEMICAL AND METALLURGICAL ENGINEERING
SECOND SEMESTER

ANP301T Applied Mineral Processing III (0,100)*
CRS301T Corrosion III (0,100)*
ENF311T Extraction of Non-Ferrous Metals III (0,100)*
EPS101T Entrepreneurial Skills** (0,083)
FAT311T Ferro-Alloy Technology III (0,100)*
QCL221T Quality Control II (0,083)
RFC321T Refractories III (0,100)*

The subject below is not compulsory for obtaining the National Diploma. However, the Department strongly recommends that students take this subject to prepare and equip them for the labour market.

GEO141T Geology I (0,000)*

TOTAL CREDITS FOR THE SEMESTER: 0,583
TOTAL CREDITS FOR THE SECOND YEAR: 1,083

THIRD YEAR

FIRST OR SECOND SEMESTER

EXP1MET Experiential Learning I (0,500)
EXP2MET Experiential Learning II (0,500)

TOTAL CREDITS FOR THE THIRD YEAR: 1,000

3.10 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: METALLURGY
Qualification code: BTMY02

REMARKS

a. Admission requirement(s): A National Diploma: Engineering: Metallurgy with Hydrometallurgy or Mineral Processing, or an NQF level 6 bachelor’s degree in Metallurgy obtained from a South African university. Any relevant NQF 6 level bachelor’s degree or diploma in Science, Engineering or Technology obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Admission is subject to selection.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (day classes).
Please note that the campus indicated is subject to change and confirmation.
e. Intake for the qualification: January only.


g. Practicals: It is compulsory for students to attend 100% of the practicals. Students must pass the practical component of a subject to be admitted to the examination.

h. Safety wear: Students are required to wear laboratory coats and other applicable protective gear during practicals. Students must purchase safety equipment and clothing themselves.

i. Textbooks: Additional textbooks and other educational material will be required.

Key to asterisk:
* Information does not correspond to information in Report 151.
(Deviations approved by the Senate in May 2007.)

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PJM401T</td>
<td>Project: Metallurgy IV (offered in both semesters)</td>
<td>(0,250)</td>
</tr>
<tr>
<td>PJM401R</td>
<td>Project: Metallurgy IV (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

plus three* of the following subjects (second-semester subjects included):

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANP401T</td>
<td>Applied Mineral Processing IV</td>
<td>(0,250)</td>
</tr>
<tr>
<td>ENF401T</td>
<td>Extraction of Non-Ferrous Metals IV</td>
<td>(0,250)</td>
</tr>
</tbody>
</table>

SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAT411T</td>
<td>Ferro-Alloy Technology IV</td>
<td>(0,250)</td>
</tr>
<tr>
<td>MGH301T</td>
<td>Metallurgical Thermodynamics III*</td>
<td>(0,250)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

3.11 MAGISTER TECHNOLOGIAE: ENGINEERING: METALLURGY
Qualification code: MTMY96

REMARKS

a. Admission requirement(s): A Baccalaureus Technologiae: Engineering: Metallurgy degree or an NQF level 7 bachelor’s or honours degree in Metallurgy obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Selection criteria: A personal interview with a departmental selection panel.
c. Duration: A minimum of one year and a maximum of three years.

d. Presentation and campus: Pretoria Campus (research).
   Please note that the campus indicated is subject to change and
   confirmation.

e. Structure: The qualification consists of a research project that must be
   recorded in the form of a dissertation.

f. Re-registration: Students must re-register for this qualification every year.

g. Subject credits: Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEY500T</td>
<td>Dissertation: Engineering: Metallurgy</td>
<td>(1,000)</td>
</tr>
<tr>
<td>MEY500R</td>
<td>Dissertation: Engineering: Metallurgy (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

3.12 DOCTOR TECHNOLOGIAE: ENGINEERING: METALLURGY
Qualification code: DTMY96

REMARKS

a. Admission requirement(s): A Magister Technologiae: Engineering: Metallurgy or an NQF
   level 8 master's degree in Metallurgy obtained from a South
   African university.
   Holders of any other equivalent South African or foreign master's
   degree may also be considered but they will have to apply in
   advance (± six months) for recognition of such qualifications.
   Foreign students will be required to submit an evaluation of
   their qualifications by the South African Qualifications Author-
   ity (SAQA). The Faculty reserves the right to assess these
   qualifications and the applicant's suitability for admission to the
   programme

b. Selection criteria: A personal interview with a departmental selection panel.

c. Duration: A minimum of two years and a maximum of five years.

d. Presentation and campus: Pretoria Campus (research).
   Please note that the campus indicated is subject to change and
   confirmation.

e. Structure: The qualification consists of a research project that must be
   recorded in the form of a thesis.

f. Re-registration: Students must re-register for this qualification every year.

g. Subject credits: Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEY700T</td>
<td>Thesis: Engineering: Metallurgy</td>
<td>(2,000)</td>
</tr>
<tr>
<td>MEY700R</td>
<td>Thesis: Engineering: Metallurgy (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 2,000
### REMARKS

**Please note:** This qualification will be offered only if there are a sufficient number of students.

a. **Admission requirement(s):** A National Diploma: Engineering: Metallurgy, a National Diploma: Ceramics Technology or an equivalent qualification. A prospective student who has a National Diploma: Ceramics Technology will have to pass Engineering Drawing prior to commencing with this programme.

b. **Selection criteria:** A personal interview with a departmental selection panel.

c. **Minimum duration:** One year.

d. **Presentation and campus:** Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

e. **Intake for the qualification:** January only.

f. **Readmission:** See Chapter 3 of the Students’ Rules and Regulations.

g. **Subject credits:** Subject credits are shown in brackets after each subject.

### SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

### FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>REF40AT</td>
<td>Refractories Engineering IVA</td>
<td>(0,200)</td>
</tr>
<tr>
<td>RFP401T</td>
<td>Refractories Engineering</td>
<td>(0,200)</td>
</tr>
<tr>
<td>RFP401R</td>
<td>Refractories Engineering Practice IV</td>
<td>(0,000)</td>
</tr>
<tr>
<td>RMR201A</td>
<td>Research Methodology: Natural Sciences</td>
<td>(0,050)</td>
</tr>
<tr>
<td>RMR201A</td>
<td>Research Methodology: Natural Sciences: Refractories</td>
<td>(0,050)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0,450

### SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARF401T</td>
<td>Applied Refractories IV</td>
<td>(0,300)</td>
</tr>
<tr>
<td>RFP401T</td>
<td>Refractories Engineering IVB</td>
<td>(0,200)</td>
</tr>
<tr>
<td>RMR201A</td>
<td>Research Methodology: Natural Sciences</td>
<td>(0,050)</td>
</tr>
<tr>
<td>RMR201A</td>
<td>Research Methodology: Natural Sciences: Statistics</td>
<td>(0,050)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0,550

**TOTAL CREDITS FOR THE QUALIFICATION:** 1,000
Syllabus content subject to change to accommodate industry changes.

**SUBJECT INFORMATION**

**SUBJECT NAME:** APPLIED MINERAL PROCESSING II  
**SUBJECT CODE:** ANP201T  
**EVALUATION METHOD:** 1 X 3-HOUR PAPER  
**TOTAL TUITION TIME:** ± 60 hours  
**OVERVIEW OF SYLLABUS:**  
Introduction to ore preparation, chemical and physical separation of ores.

**SUBJECT NAME:** APPLIED MINERAL PROCESSING III  
**SUBJECT CODE:** ANP301T  
**EVALUATION METHOD:** 1 X 3-HOUR PAPER  
**TOTAL TUITION TIME:** ± 60 hours  
**OVERVIEW OF SYLLABUS:**  

**SUBJECT NAME:** APPLIED MINERAL PROCESSING IV  
**SUBJECT CODE:** ANP401T  
**EVALUATION METHOD:** CONTINUOUS ASSESSMENT  
**TOTAL TUITION TIME:** ± 60 hours  
**OVERVIEW OF SYLLABUS:**  
Project that consists of a mineral processing plant design. Cost estimation. Metallurgical plant commissioning.

**SUBJECT NAME:** APPLIED REFRactories IV  
**SUBJECT CODE:** ARF401T  
**EVALUATION METHOD:** CONTINUOUS ASSESSMENT  
**TOTAL TUITION TIME:** ± 60 hours  
**OVERVIEW OF SYLLABUS:**  

**SUBJECT NAME:** CHEMICAL ENGINEERING TECHNOLOGY IIIA  
**SUBJECT CODE:** CET33AT  
**EVALUATION METHOD:** 1 X 3-HOUR PAPER  
**TOTAL TUITION TIME:** ± 60 hours  
**OVERVIEW OF SYLLABUS:**  
Combined mass and energy balances, introduction to heat and mass transfer, fluid dynamics, pressure drops in pipes (Bernoulli's equation), humidity.

**SUBJECT NAME:** CHEMICAL ENGINEERING TECHNOLOGY IIIB  
**SUBJECT CODE:** CET33BT  
**EVALUATION METHOD:** 1 X 3-HOUR PAPER  
**TOTAL TUITION TIME:** ± 60 hours  
**OVERVIEW OF SYLLABUS:**  
Gas absorption, distillation, evaporation, drying and filtration.

**SUBJECT NAME:** CHEMICAL ENGINEERING TECHNOLOGY: CHEMICAL PRINCIPLES II  
**SUBJECT CODE:** CET20XT  
**EVALUATION METHOD:** 1 X 3-HOUR PAPER  
**TOTAL TUITION TIME:** ± 60 hours  
**OVERVIEW OF SYLLABUS:**  
Basic principles and calculation in chemical and metallurgical engineering: units and dimensions, chemical equation and stoichiometry. Gas laws. Material and energy balances.
SUBJECT NAME: CHEMICAL ENGINEERING TECHNOLOGY: CHEMICAL PRINCIPLES II
SUBJECT CODE: CET21XT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
An introduction to the different units used in various applications of Chemical Engineering in industry, conversions of these in calculations, material and mass balance calculations, applications of stoichiometry in processes, thermodynamic calculations and implications of the results for processes, software in chemical engineering.

SUBJECT NAME: CHEMICAL ENGINEERING TECHNOLOGY: FLUID FLOW IV
SUBJECT CODE: CET40XT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CHEMICAL ENGINEERING TECHNOLOGY: HEAT AND MASS TRANSFER IV
SUBJECT CODE: CET40YT
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CHEMICAL ENGINEERING TECHNOLOGY: METALLURGICAL PRINCIPLES II
SUBJECT CODE: CET20YT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Introduction to mineral processing: sample preparation, particle size analysis, comminution, crushing, grinding, industrial screening, and classification. Overview of concentration techniques: density, magnetic, electrostatic separations, froth flotation.

SUBJECT NAME: CHEMICAL ENGINEERING TECHNOLOGY: METALLURGICAL PRINCIPLES II
SUBJECT CODE: CET21YT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
An introduction to the different units used in various applications of Chemical Engineering in industry, conversions of these in calculations, material and mass balance calculations, applications of stoichiometry in processes, thermodynamic calculations and implications of the results for processes, software in chemical engineering.

SUBJECT NAME: CHEMICAL ENGINEERING TECHNOLOGY: UNIT OPERATIONS IV
SUBJECT CODE: CET40ZT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Design project, consisting of the design of a processes unit (heat exchangers, furnaces, distillation columns, etc.). Different stages in the development of a design, conceptual design, physical data collection, economic evaluation, flow diagrams, final detailed design.
SUBJECT NAME: CHEMICAL PLANT IIIA  
SUBJECT CODE: CMP33AT  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 60 hours  
OVERVIEW OF SYLLABUS: Corrosion, materials technology, water treatment, mechanical separation, equipment, size reduction, material handling and storage, environmental protection.

SUBJECT NAME: CHEMICAL PLANT IIIB  
SUBJECT CODE: CMP33BT  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 60 hours  
OVERVIEW OF SYLLABUS: Piping, pumps, compressors, fans, heat exchangers, combustion, mixing and cooling towers.

SUBJECT NAME: CHEMICAL PROCESS DESIGN: EQUIPMENT DESIGN IV  
SUBJECT CODE: CPD40XT  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 60 hours  

SUBJECT NAME: CHEMICAL PROCESS DESIGN: PLANT DESIGN IV  
SUBJECT CODE: CPD40YT  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 60 hours  
OVERVIEW OF SYLLABUS: The development of a conceptual flow sheet for a specific chemical process. Familiarisation with the functioning of a process simulator. Flow sheet design and simulation on the process simulator.

SUBJECT NAME: CHEMICAL PROCESS DESIGN: PRINCIPLES III  
SUBJECT CODE: CPP301T  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 60 hours  

SUBJECT NAME: CHEMICAL PROCESS INDUSTRIES II  
SUBJECT CODE: CPI201T  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 60 hours  

SUBJECT NAME: CHEMISTRY IA  
SUBJECT CODE: CHE141B  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 60 hours  
SUBJECT NAME: CHEMISTRY IA
SUBJECT CODE: CHE151B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
A strong emphasis will be placed on covering the practical aspects of the following topics in the laboratory, as this is an area which requires particular attention for the extended curriculum of Chemical Engineering: Scientific methodology and its use in discovering chemistry. Numbers in chemistry, the use of SI units, matter and atomic structure. Compounds in chemistry, the mole concept and chemical calculations. The electronic structure of the atom and electronic configurations in the periodic table. Chemical bonding. The states of matter and the binding forces within matter. Basic concepts of the gas laws. Solutions in chemistry. Acids, bases and salts. Oxidation and reduction and the balancing of equations. Organic chemistry and the chemistry of life.

SUBJECT NAME: COMMUNICATION SKILLS I
SUBJECT CODE: COS151T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Specific, discipline-related interpretation, presentation and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. The students will be introduced to aspects of scaffolded reading as a tool to acquire knowledge and interpretative abilities in their subject disciplines.

SUBJECT NAME: COMPUTER SKILLS I
SUBJECT CODE: CSK101B
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CORROSION III
SUBJECT CODE: CRS301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: DRAWING: CHEMICAL ENGINEERING I
SUBJECT CODE: DCE111T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ENGINEERING PHYSICS II
SUBJECT CODE: EPH201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Fluid flow, ideal and viscous fluids, heat transfer, hygrometry, nuclear reactions, electrical principles, practical work.
SUBJECT NAME: ENTREPRENEURIAL SKILLS
SUBJECT CODE: EPS101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: EXPERIENTIAL LEARNING I
SUBJECT CODE: EXP1ECH
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
Students must complete a work-related project at the employer that has been approved by the University.

SUBJECT NAME: EXPERIENTIAL LEARNING II
SUBJECT CODE: EXP2ECH
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
Students must complete a work-related project at the employer that has been approved by the University.

SUBJECT NAME: EXTRACTION OF NON-FERROUS METALS II
SUBJECT CODE: ENF201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: EXTRACTION OF NON-FERROUS METALS III
SUBJECT CODE: ENF311T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Copper, gold, aluminium, lead, tin and zinc. Calculations. Laboratory practice. Casting of non-ferrous metals.
SUBJECT NAME: EXTRACTION OF NON-FERROUS METALS IV
SUBJECT CODE: ENF401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FERRO-ALLOY TECHNOLOGY II
SUBJECT CODE: FAT201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FERRO-ALLOY TECHNOLOGY III
SUBJECT CODE: FAT311T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FERRO-ALLOY TECHNOLOGY IV
SUBJECT CODE: FAT411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION ACADEMIC SKILLS
SUBJECT CODE: FPACA01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
• The important aspects of life skills: Campus ethics, learning styles and whole-brain thinking, self-image and assertive behaviour, time management, self-motivation, conflict management, sexuality and relationships, problem-solving skills, managing stress, multicultural society, techniques for summarising and memorising, how to cope with assessments and assignments, creativity, and many more. The life-skills sessions are participative, with group discussions and personal application to optimise the student’s learning experience.
• The important aspects of English communication: Interpret, relate and reflect on all available and relevant resource material in proper English. Communicate orally in a comprehensible and clear manner in both general and subject-specific communication. Demonstrate intermediate-level proficiency in written English.
• An element of Computer Literacy is woven throughout the presentation of this subject as well as the Mathematics course. Students will be introduced to the basic functions of personal computing, Windows, word processors and other software, and engage in e-learning as a way of becoming familiar with this kind of technology.
SUBJECT NAME: FOUNDATION APPLIED SCIENCE
SUBJECT CODE: FPAPP01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
An introduction to physics, statics, dynamics and electricity, dealing with the following topics: Atom theory, electricity, magnetism and electromagnetism, inductors, capacitors, RLC networks. Basic concepts of atomic bonds, crystal structures and material properties. Control over properties by heat treatment, microstructure and phase diagrams. Measuring material properties with mechanical tests like tensile tests, hardness tests, impact tests, etc. General forming processes, plastic strain, strain hardening, hot working, cold working, recrystallisation. Properties and uses of the well-known non-ferrous alloys. The basic properties and behaviour of ceramics, polymers and compound materials. Measurements, mechanics, motion in one-dimension kinematics, laws of motion dynamics, kinetic theory of matter and properties of matter, introduction to the biological sciences, general laws of movement, mechanics, heat, hydrodynamics, electricity and magnetism, wave motion, and nuclear physics.

SUBJECT NAME: FOUNDATION CHEMICAL ENGINEERING TECHNOLOGY: CHEMICAL PRINCIPLES II
SUBJECT CODE: FPCET01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
Introduction to engineering (chemical, metallurgical, civil, surveying, electrical, clinical, digital technology, high-frequency technology, power engineering, process instrumentation, mechanical, industrial, mechatronics), factory safety, measurements, engineering materials, projects. Basic principles and calculation in chemical and metallurgical engineering: units and dimensions, chemical equation and stoichiometry. Gas laws. Material and energy balances.

SUBJECT NAME: FOUNDATION CHEMISTRY IA
SUBJECT CODE: FPCHE03
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
Atoms, molecules and ions, chemical formulas and equations, the periodic table, chemical bonding, nomenclature of inorganic compounds, phases of matter, solutions, the rate of chemical reactions, equilibrium in chemical reactions, acids and bases, oxidation, reduction and electrochemical cells. Matter and energy: atomic structure, chemical bonding, periodic table and nomenclature of inorganic compounds. Chemical equations and stoichiometry. Solutions. Acids, bases and salts. Chemical reactions. Chemical equilibrium. Electrochemistry and redox theory. Introduction to inorganic and organic chemistry. Practical: experiments based on the theory, with the emphasis on basic laboratory techniques.

SUBJECT NAME: FOUNDATION COMMUNICATION SKILLS I
SUBJECT CODE: FPCOS02
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
Speaking and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. Communication theory. Oral presentation. Technical writing skills. Group communication skills.

SUBJECT NAME: FOUNDATION COMPUTER SKILLS I
SUBJECT CODE: FPCSK02
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
Operating systems (Windows environment); Basic word-processing skills (MS-Word); Spreadsheets (MS-Excel); Presentations tools (PowerPoint); Communications, connectivity, the internet and the Web; Components of a microcomputer; Application of software; Managing personal computers.
SUBJECT NAME: FOUNDATION DRAWING: CHEMICAL ENGINEERING I  
SUBJECT CODE: FPDCE01  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 120 hours  
OVERVIEW OF SYLLABUS:  

SUBJECT NAME: FOUNDATION ENGINEERING  
SUBJECT CODE: FPEGI01  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 64 hours  
OVERVIEW OF SYLLABUS:  
An introduction to technical drawing as well as the type of skills, workplace environments and knowledge required in all the major fields of engineering that are practised in the South African economy.

SUBJECT NAME: FOUNDATION MATHEMATICS  
SUBJECT CODE: FPMAT05  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 64 hours  
OVERVIEW OF SYLLABUS:  
Basic algebra, functions, exponents and logarithm, differential calculus, trigonometry, geometry. Basic mathematics. Differentiation. Integration. Matrices and determinants. Vectors. Data handling. Complex numbers or mensuration. Students will be introduced to personal computers, Windows and e-learning technologies as a fundamental part of this subject.

SUBJECT NAME: FOUNDATION MATHEMATICS I  
SUBJECT CODE: FPMAT04  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 120 hours  
OVERVIEW OF SYLLABUS:  

SUBJECT NAME: FOUNDATION MECHANICAL ENGINEERING DRAWING I  
SUBJECT CODE: FPMDR01  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 120 hours  
OVERVIEW OF SYLLABUS:  

SUBJECT NAME: FOUNDATION METALLURGY I  
SUBJECT CODE: FPMEY01  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 120 hours  
OVERVIEW OF SYLLABUS:  
Atom theory, electricity, magnetism and electromagnetism, inductors, capacitors, RLC networks. Basic concepts of atomic bonds, crystal structures and material properties. Control over properties by heat treatment, microstructure and phase diagrams. Measuring material properties with mechanical tests like tensile tests, hardness tests, impact tests, etc. General forming processes, plastic strain, strain hardening, hot working, cold working, recrystallisation. Getting acquainted with the well-known non-ferrous alloys. The basic properties and behaviour of ceramics, polymers and compound materials.
SUBJECT NAME: FOUNDATION MINERAL PROCESSING: CHEMICAL PRINCIPLES II
SUBJECT CODE: FPMNP01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours

OVERVIEW OF SYLLABUS:
Introduction to engineering (chemical, metallurgical, civil, surveying, electrical, clinical, digital technology, high -frequency technology, power engineering, process instrumentation, mechanical, industrial, mechatronics), factory safety, measurements, engineering materials and projects. Understanding the units and dimensions of the British, SI and American engineering systems. Converting one set of units to another. Defining a mole and converting from moles to mass and the reverse for any chemical compound, given the molecular weight. Writing and balancing chemical reaction equations. Calculating the stoichiometric quantities of reactants and products, given the chemical reaction. Understanding the mass conservation law. Calculating material balances for systems without chemical reactions. Calculating material balances for systems with chemical reactions.

SUBJECT NAME: FOUNDATION PHYSICS IA
SUBJECT CODE: FPPHU03
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours

OVERVIEW OF SYLLABUS:

SUBJECT NAME: GEOLOGY I
SUBJECT CODE: GEO141T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours

OVERVIEW OF SYLLABUS:

SUBJECT NAME: INORGANIC CHEMISTRY II
SUBJECT CODE: ICH231T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours

OVERVIEW OF SYLLABUS:
Introduction to chemical bonding and an advanced study of ionic bonding. Chemical reactions in aqueous and non-aqueous solutions. Redox chemistry. Interpretation of oxidation state diagrams. Descriptive inorganic chemistry. Practical inorganic chemistry.

SUBJECT NAME: MANAGEMENT SKILLS I
SUBJECT CODE: MSK121T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours

OVERVIEW OF SYLLABUS:
Self-management, organisational environment, introduction to leadership and management principles.

SUBJECT NAME: MATHEMATICS I
SUBJECT CODE: MAT171T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours

OVERVIEW OF SYLLABUS:
SUBJECT NAME: MATHEMATICS I
SUBJECT CODE: MAT181T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive introduction to the theorems and applications of the differential calculus, trigonometry, algebra and matrices. Elementary data handling and vector calculations are also introduced with practical introductions to the applications specific to the engineering discipline in which the student is registered.

SUBJECT NAME: MATHEMATICS II
SUBJECT CODE: MAT271T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MATHEMATICS: CHEMICAL ENGINEERING III
SUBJECT CODE: MTE301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICAL ENGINEERING DRAWING I
SUBJECT CODE: MDR101C
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: METALLURGICAL CHEMISTRY II
SUBJECT CODE: MCI201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: METALLURGICAL THERMODYNAMICS II
SUBJECT CODE: MGH201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: METALLURGICAL THERMODYNAMICS III
SUBJECT CODE: MGH301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: METALLURGY I
SUBJECT CODE: MEY101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Basic concepts of atomic bonds, crystal structures and material properties. Control over properties by heat treatment, microstructure and phase diagrams. Measuring material properties with mechanical tests like tensile tests, hardness tests, impact tests, etc. General forming processes, plastic strain, strain hardening, hot working, cold working, recrystallisation. Getting acquainted with the well-known non-ferrous alloys. The basic properties and behaviour of ceramics, polymers and compound materials.

SUBJECT NAME: MINERAL PROCESSING: CHEMICAL PRINCIPLES II
SUBJECT CODE: MNP21XT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
An introduction to the different units used in various applications of Chemical Engineering in industry, conversions of these in calculations, material and mass balance calculations, applications of stoichiometry in processes, thermodynamic calculations and implications of the results for processes, software in chemical engineering.

SUBJECT NAME: MINERAL PROCESSING: CHEMICAL PRINCIPLES II
SUBJECT CODE: MNP20XT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Understanding the units and dimensions of the British, SI and American engineering systems. Converting one set of units to another. Defining a mole and converting from moles to mass and the reverse for any chemical compound, given the molecular weight. Writing and balancing chemical reaction equations. Calculating the stoichiometric quantities of reactants and products, given the chemical reaction. Understanding the mass conservation law. Calculating material balances for systems without chemical reactions. Calculating material balances for systems with chemical reactions.

SUBJECT NAME: MINERAL PROCESSING: METALLURGICAL PRINCIPLES II
SUBJECT CODE: MNP21YT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
An introduction to the different units used in various applications of Chemical Engineering in industry, conversions of these in calculations, material and mass balance calculations, applications of stoichiometry in processes, thermodynamic calculations and implications of the results for processes, software in chemical engineering.

SUBJECT NAME: MINERAL PROCESSING: METALLURGICAL PRINCIPLES II
SUBJECT CODE: MNP20YT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Ideal gas equation of state, PVT behaviour and cubic equations of state, energy balances and first law of thermodynamics, steam tables, phase changes and humidification processes, state properties and process changes, mixing and solution processes, effect of reactions on material and energy balances.

SUBJECT NAME: ORGANIC CHEMISTRY II
SUBJECT CODE: OCH221T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: PHYSICAL CHEMISTRY II
SUBJECT CODE: PCB221T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: PHYSICAL METALLURGY I
SUBJECT CODE: PML101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Binary phase diagrams and their interpretation, phase reactions, equilibria and non-equilibrium solidification of F3-Fe3C, Al-Si and Cu-Zn systems. Strengthening mechanisms, solidification phenomena. Heat treatment: the common processes like annealing, normalising, hardening, martempering, etc. Hardenability and the use of hardenability data. IT diagrams corrosion: an introduction to the eight basic corrosion types.

SUBJECT NAME: PHYSICS IA
SUBJECT CODE: PHU161B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
A general physics qualification with applications in the biological sciences. This includes, inter alia, general laws of movement, mechanics, heat, hydrodynamics, electricity and magnetism, wave motion, and nuclear physics.

SUBJECT NAME: PRACTICAL METALLURGY II
SUBJECT CODE: PMU201T
EVALUATION METHOD: PRACTICAL
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: PROCESS CONTROL III
SUBJECT CODE: PCT301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Process and instrumentation diagram, instrumentation, control, typical control systems, alarm and safety, Hazop studies.

SUBJECT NAME: PROCESS CONTROL IV
SUBJECT CODE: PCT401B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Chemical process modelling, Laplace transform, dynamic analysis of processing systems, design of feedback, feed-forward and other control systems. The focus is on understanding control design principles and their implementation in the chemical processing industry.
OVERVIEW OF SYLLABUS:

OVERVIEW OF SYLLABUS:
Students must undertake an experimental examination of an approved physical or extractive metallurgical topic. It must consist of a literature study, planning and execution of experimental work, the interpretation of results and an oral, as well as a written report.

OVERVIEW OF SYLLABUS:

OVERVIEW OF SYLLABUS:

OVERVIEW OF SYLLABUS:
SUBJECT NAME: REFRACTORIES III
SUBJECT CODE: RFC321T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: REFRACTORIES ENGINEERING IVA
SUBJECT CODE: REF40AT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: REFRACTORIES ENGINEERING IVB
SUBJECT CODE: REF40BT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: RESEARCH METHODOLOGY: NATURAL SCIENCES: REFRACTORIES
SUBJECT CODE: RMR20XA
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Introduction, research tools, problem identification and development, review of related literature, planning of research proposals, instrumentation, writing proposals, presenting results of research, statistics, working with a supervisor.

SUBJECT NAME: RESEARCH METHODOLOGY: NATURAL SCIENCES: STATISTICS
SUBJECT CODE: RMR20YA
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Statistical methods for the preparation of, and working with data, including descriptive statistical methods.

SUBJECT NAME: STRENGTH OF MATERIALS II
SUBJECT CODE: SMM201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: THERMODYNAMICS: APPLIED III
SUBJECT CODE: TDA301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: THERMODYNAMICS: CHEMICAL ENGINEERING III
SUBJECT CODE: TCE301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
4. DEPARTMENT OF CIVIL ENGINEERING

4.1 NATIONAL DIPLOMA: ENGINEERING: CIVIL (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)
(Pending final approval – DoE)
Qualification code: NDCIF1

REMARKS
a. Admission requirement(s) and selection criteria:

• FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

Admission requirement(s): A Senior Certificate or an equivalent qualification, with F symbols at the Higher Grade or E symbols at the Standard Grade for English, Mathematics and Physical Science.

Recommended subject(s): None.

Selection criteria: Prospective students who meet the above requirements, will sit for an admission test. Admission to either the formal qualification or a preparation programme is determined by a combination of the results of the admission test and the Senior Certificate marks. The offer to a prospective student of a place expires six months after the date on which the admission test is written.

• FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

See qualification NDCI03.

b. Minimum duration: Four years.

c. Presentation and campus: Pretoria Campus (day classes).

Please note that the campus indicated is subject to change and confirmation.

d. Intake for the qualification: January and July.

e. Readmission: See Chapter 3 of the Students’ Rules and Regulations.

f. Experiential Learning I and II: See Chapter 5 of the Students’ Rules and Regulations. Experiential learning is usually undertaken during the second study year. However, students who do not find employment will be permitted to continue with the third study year and complete their experiential learning afterwards.

g. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks
** Students who register for Reinforced Concrete and Masonry Design III should register for Structural Analysis III concurrently.
### FIRST YEAR

#### FIRST SEMESTER

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<th>CODE</th>
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<th>PREREQUISITE SUBJECT(S)</th>
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<tbody>
<tr>
<td>FPACA01</td>
<td>Foundation Academic Skills</td>
<td>(0.100)</td>
<td></td>
</tr>
<tr>
<td>FPAPP01</td>
<td>Foundation Applied Science</td>
<td>(0.050)</td>
<td></td>
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<tr>
<td>FPEGI01</td>
<td>Foundation Engineering</td>
<td>(0.050)</td>
<td></td>
</tr>
<tr>
<td>FPMAT05</td>
<td>Foundation Mathematics</td>
<td>(0.050)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.250

#### SECOND SEMESTER

After completing all of the above subjects.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AME121T</td>
<td>Applied Mechanics I</td>
<td>(0.085)</td>
<td></td>
</tr>
<tr>
<td>CSK101E</td>
<td>Computer Skills I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>MAT181T</td>
<td>Mathematics I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>SUR111T</td>
<td>Surveying I</td>
<td>(0.056)</td>
<td></td>
</tr>
<tr>
<td>SUR11YT</td>
<td>Surveying: Theory I</td>
<td>(0.027)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.334

TOTAL CREDITS FOR THE FIRST YEAR: 0.584

### SECOND YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COS151T</td>
<td>Communication Skills I</td>
<td>(0.043)</td>
<td></td>
</tr>
<tr>
<td>CSM101T</td>
<td>Construction Materials I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>DRW101T</td>
<td>Drawing I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>MAT281T</td>
<td>Mathematics II</td>
<td>(0.083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>SUC201T</td>
<td>Surveying: Civil II</td>
<td>(0.021)</td>
<td>Surveying I</td>
</tr>
<tr>
<td>SUC20XT</td>
<td>Surveying: Civil: Theory II</td>
<td>(0.021)</td>
<td>Surveying I</td>
</tr>
<tr>
<td>SUC20YT</td>
<td>Surveying: Civil: Practical II</td>
<td>(0.021)</td>
<td>Surveying I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.334

#### SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRW201T</td>
<td>Drawing II</td>
<td>(0.083)</td>
<td>Drawing I</td>
</tr>
<tr>
<td>KME101T</td>
<td>Construction Methods I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>MNC101T</td>
<td>Management: Civil I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>TSC221T</td>
<td>Theory of Structures II</td>
<td>(0.083)</td>
<td>Applied Mechanics I</td>
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</table>

TOTAL CREDITS FOR THE SEMESTER: 0.332

TOTAL CREDITS FOR THE SECOND YEAR: 0.666

### THIRD YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP1ECI</td>
<td>Experiential Learning I</td>
<td>(0.400)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.400
SECOND SEMESTER

EXP2ECI  Experiential Learning II  (0,400)

TOTAL CREDITS FOR THE SEMESTER: 0,400

TOTAL CREDITS FOR THE THIRD YEAR: 0,800

FOURTH YEAR

FIRST SEMESTER

GTE201T Geotechnical Engineering II  (0,083)
MNC201T Management: Civil II  (0,083)  Management: Civil I
SAS201T Structural Analysis II  (0,043)  Theory of Structures II
SST301T Structural Steel and Timber Design III  (0,083)  Theory of Structures II
TEN201T Transportation Engineering II  (0,083)  Drawing I
WEN201T Water Engineering II  (0,100)  Applied Mechanics I
Mathematics I

TOTAL CREDITS FOR THE SEMESTER: 0,475

SECOND SEMESTER

DOC301T Documentation III  (0,083)  Management: Civil II
GTE301T Geotechnical Engineering III  (0,083)  Geotechnical Engineering II
RCM301T Reinforced Concrete and Masonry Design III**  (0,083)  Theory of Structures II
SAS301T Structural Analysis III**  (0,043)  Structural Analysis II
TEN301T Transportation Engineering III  (0,083)  Transportation Engineering II
WEN301T Water Engineering III  (0,100)  Water Engineering II

TOTAL CREDITS FOR THE SEMESTER: 0,475

TOTAL CREDITS FOR THE FOURTH YEAR: 0,950

4.2 NATIONAL DIPLOMA: ENGINEERING: CIVIL (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)
(Pending final approval – Senate)
Qualification code: NDCIF0

NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2009. STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL 2014 TO OBTAIN IT, SUBJECT TO THE STIPULATIONS OF REGULATION 3.1.1 ON THE MAXIMUM DURATION OF STUDY.
Phase-out date: 31 December 2014

Presentation and Campus:
Pretoria Campus (day classes).
Please note that the campus indicated is subject to change and confirmation.

Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.
SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPAME01</td>
<td>Foundation Applied Mechanics I</td>
<td>(0.085)</td>
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<td>FPCOS02</td>
<td>Foundation Communication Skills I</td>
<td>(0.043)</td>
</tr>
<tr>
<td>FPCSK02</td>
<td>Foundation Computer Skills I</td>
<td>(0.083)</td>
</tr>
<tr>
<td>FPCSM01</td>
<td>Foundation Construction Materials I</td>
<td>(0.083)</td>
</tr>
<tr>
<td>FPDRW01</td>
<td>Foundation Drawing I</td>
<td>(0.083)</td>
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<tr>
<td>FPMAT04</td>
<td>Foundation Mathematics I</td>
<td>(0.083)</td>
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<tr>
<td>FPSUR01</td>
<td>Foundation Surveying I</td>
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<tr>
<td>FPSURYT</td>
<td>Foundation Surveying: Theory I</td>
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</tr>
<tr>
<td>FPSURZT</td>
<td>Foundation Surveying: Practical I</td>
<td>(0.027)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE FIRST YEAR: **0.543**

As from the second year, students will continue with the subjects of the second semester of the qualification NDCI03, except for Communication Skills I. Students will still register for the qualification code NDCIF0. Students will not be permitted to continue with the subjects of the second semester of the first year if all the subjects of the foundation year have not been passed.

### 4.3 NATIONAL DIPLOMA: ENGINEERING: CIVIL
Qualification code: NDCI03

**REMARKS**

a. **Admission requirement(s):**

For students who obtained a Senior Certificate before 2008: A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics and an E symbol at the Higher Grade or a D symbol at the Standard Grade for Physical Science.

For students who have obtained a National Senior Certificate since 2008: A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

b. **Recommended subject(s):** None.

c. **Selection criteria:**

Candidates with an APS score of 24+ will be admitted to the National Diploma or the National Diploma (Extended Curriculum). A candidate’s performance in an academic placement test written in January as part of the Faculty’s orientation programme will determine whether he or she will be channelled to the National Diploma or National Diploma (Extended Curriculum).

**FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
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</thead>
<tbody>
<tr>
<td>7</td>
<td>A</td>
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<td>6</td>
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<td>5</td>
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<td>C</td>
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<tr>
<td>3</td>
<td>E</td>
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<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)
FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL APS SCORE** (six subjects, excluding Life Orientation) 24

d. Minimum duration: Three years.
e. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.
f. Intake for the qualification: January and July.
g. Readmission: See Chapter 3 of the Students' Rules and Regulations.
h. Experiential Learning I and II: See Chapter 5 of the Students' Rules and Regulations. Experiential learning is usually undertaken during the second study year. However, students who do not find employment will be permitted to continue with the third study year and complete their experiential learning afterwards.
i. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).
j. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks
* Information does not correspond to information in Report 151. (Deviations approved by the Senate in August 2005.)
** Students who register for Reinforced Concrete and Masonry Design III should register for Structural Analysis III concurrently.

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST YEAR

FIRST OR SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AME111T</td>
<td>Applied Mechanics I</td>
<td>(0.085)*</td>
<td></td>
</tr>
<tr>
<td>CSK101E</td>
<td>Computer Skills I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>CSM101T</td>
<td>Construction Materials I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>DRW101T</td>
<td>Drawing I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
<td>(0.083)</td>
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</tr>
<tr>
<td>SUR111T</td>
<td>Surveying I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUR11YT</td>
<td>Surveying: Theory I</td>
<td>(0.056)</td>
<td></td>
</tr>
<tr>
<td>SUR11ZT</td>
<td>Surveying: Practical I</td>
<td>(0.027)</td>
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</table>

TOTAL CREDITS FOR THE SEMESTER: 0.500
SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>COS101T</td>
<td>Communication Skills I</td>
<td>(0,043)*</td>
<td></td>
</tr>
<tr>
<td>DRW201T</td>
<td>Drawing II</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>KME101T</td>
<td>Construction Methods I</td>
<td>(0,083)</td>
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<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0,083)</td>
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<tr>
<td>MNC101T</td>
<td>Management: Civil I</td>
<td>(0,083)</td>
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</tr>
<tr>
<td>SUC201T</td>
<td>Surveying: Civil II</td>
<td>(0,021)</td>
<td></td>
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<tr>
<td>SUC20XT</td>
<td>Surveying: Civil: Theory II</td>
<td>(0,021)</td>
<td></td>
</tr>
<tr>
<td>SUC20YT</td>
<td>Surveying: Civil: Practical II</td>
<td>(0,021)</td>
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</tr>
<tr>
<td>TSC211T</td>
<td>Theory of Structures II</td>
<td>(0,083)</td>
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</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP1ECI</td>
<td>Experiential Learning I</td>
<td>(0,500)</td>
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</tbody>
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TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>EXP2ECI</td>
<td>Experiential Learning II</td>
<td>(0,500)</td>
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</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE SECOND YEAR: 1,000

THIRD YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTE201T</td>
<td>Geotechnical Engineering II</td>
<td>(0,083)</td>
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</tr>
<tr>
<td>MNC201T</td>
<td>Management: Civil II</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>SAS201T</td>
<td>Structural Analysis II</td>
<td>(0,043)*</td>
<td></td>
</tr>
<tr>
<td>SST301T</td>
<td>Structural Steel and Timber Design III</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>TEN201T</td>
<td>Transportation Engineering II</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>WEN201T</td>
<td>Water Engineering II</td>
<td>(0,125)</td>
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TOTAL CREDITS FOR THE SEMESTER: 0,500
SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>DOC301T</td>
<td>Documentation III</td>
<td>(0,083)</td>
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<tr>
<td>GTE301T</td>
<td>Geotechnical Engineering III</td>
<td>(0,083)</td>
</tr>
<tr>
<td>RCM301T</td>
<td>Reinforced Concrete and Masonry Design III**</td>
<td>(0,083)</td>
</tr>
<tr>
<td>SAS301T</td>
<td>Structural Analysis III**</td>
<td>(0,043)*</td>
</tr>
<tr>
<td>TEN301T</td>
<td>Transportation Engineering III</td>
<td>(0,083)</td>
</tr>
<tr>
<td>WEN301T</td>
<td>Water Engineering III</td>
<td>(0,125)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE THIRD YEAR: 1,000

4.4 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL: CONSTRUCTION MANAGEMENT

Qualification code: BTKG02

REMARKS

a. Admission requirement(s): A National Diploma: Engineering: Civil or an NQF level 6 diploma or bachelor’s degree in Civil Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (+ six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Selection is based on a personal interview with a departmental selection panel.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes offered over a period of two years).

Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.


g. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

h. Subject credits: Subject credits are shown in brackets after each subject.

Please note: Students must pass eight subjects. They must take a minimum of five subjects in their particular field of specialisation, with the balance made up of subjects offered in the other fields of specialisation. Subjects are offered as determined by the Head of the Department. The total credits of the Level IV subjects may not be less than 0,500.

Construction Materials Technology IV may not be taken in combination with either Concrete Technology IV or Asphalt Technology IV, or with both.
FIRST SEMESTER (2010)

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
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<tbody>
<tr>
<td>IRN201B</td>
<td>Industrial Relations and Negotiation II</td>
<td>(0,125)</td>
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<tr>
<td>MPP401B</td>
<td>Management Principles and Practice IV</td>
<td>(0,125)</td>
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SECOND SEMESTER (2010)

No subjects in this field of specialisation will be presented in this semester.

FIRST SEMESTER (2011)

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
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<tbody>
<tr>
<td>CLC101T</td>
<td>Commercial Law: Civil</td>
<td>(0,125)</td>
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<tr>
<td>FMN301T</td>
<td>Financial Management III</td>
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SECOND SEMESTER (2011)

<table>
<thead>
<tr>
<th>CODE</th>
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<tbody>
<tr>
<td>PJG401T</td>
<td>Project Management: Civil IV</td>
<td>(0,125)</td>
</tr>
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</table>

TOTAL CREDITS FOR THE QUALIFICATION: **1,000**

**4.5 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL: ENVIRONMENTAL ENGINEERING**

Qualification code: BTOI02

**REMARKS**

a. Admission requirement(s): A National Diploma: Engineering: Civil or an NQF level 6 diploma or bachelor’s degree in Civil Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Selection is based on a personal interview with a departmental selection panel.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes offered over a period of two years).

Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.

g. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

h. Subject credits: Subject credits are shown in brackets after each subject.

Please note:
Students must obtain one credit. The Department strongly advises students who wish to register with the Engineering Council of South Africa (ECSA) to pass all the prescribed subjects indicated in this field of specialisation.

Students who prefers not to register with ECSA must take a minimum of five subjects in this particular field of specialisation, with the balance made up of subjects offered in the other fields of specialisation. Subjects are offered as determined by the Head of the Department. The total credits of the Level IV subjects may not be less than 0,500.

Construction Materials Technology IV may not be taken in combination with either Concrete Technology IV or Asphalt Technology IV, or with both.

**FIRST SEMESTER (2010)**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENN401T</td>
<td>Environmental Management for Engineers: Civil IV</td>
<td>(0,125)</td>
</tr>
<tr>
<td>WAT401T</td>
<td>Water Resource Management: Civil IV</td>
<td>(0,125)</td>
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</table>

**SECOND SEMESTER (2010)**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
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<tbody>
<tr>
<td>SOI401T</td>
<td>Soil and Ground Water Pollution: Civil IV</td>
<td>(0,125)</td>
</tr>
<tr>
<td>SWM401T</td>
<td>Solid Waste Management IV</td>
<td>(0,125)</td>
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**FIRST SEMESTER (2011)**

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<th>SUBJECT</th>
<th>CREDIT</th>
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<tbody>
<tr>
<td>SIA401T</td>
<td>Social Environmental Studies: Civil IV</td>
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**SECOND SEMESTER (2011)**

<table>
<thead>
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<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENR401T</td>
<td>Environmental Engineering: Civil IV</td>
<td>(0,250)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE QUALIFICATION:** 1,000

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### 4.6 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL: GEOTECHNICAL ENGINEERING

**Qualification code:** BTGO02

**REMARKS**

a. Admission requirement(s): A National Diploma: Engineering: Civil or an NQF level 6 diploma or bachelor’s degree in Civil Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualification. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.
b. Selection criteria: Selection is based on a personal interview with a departmental selection panel.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes offered over a period of two years). Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.


g. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

h. Subject credits: Subject credits are shown in brackets after each subject.

Please note:
Students must pass eight subjects. They must take a minimum of five subjects in their particular field of specialisation, with the balance made up of subjects offered in the other fields of specialisation. Subjects are offered as determined by the Head of the Department. The total credits of the Level IV subjects may not be less than 0,500.

Construction Materials Technology IV may not be taken in combination with either Concrete Technology IV or Asphalt Technology IV, or with both.

FIRST SEMESTER (2010)

<table>
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<td>HGE301B</td>
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<td>KMT401T</td>
<td>Construction Materials Technology IV</td>
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SECOND SEMESTER (2010)

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<tr>
<th>CODE</th>
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</thead>
<tbody>
<tr>
<td>FDE401T</td>
<td>Foundation Engineering IV</td>
<td>(0,125)</td>
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FIRST SEMESTER (2011)

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<td>Earthworks Design IV</td>
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<tr>
<td>GEC401T</td>
<td>Geology: Civil IV</td>
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SECOND SEMESTER (2011)

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<th>CODE</th>
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<tbody>
<tr>
<td>AGM401T</td>
<td>Applied Geomechanics IV</td>
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TOTAL CREDITS FOR THE QUALIFICATION: 1,000
4.7 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL:
STRUCTURAL ENGINEERING
Qualification code: BTSQ02

REMARKS

a. Admission requirement(s): A National Diploma: Engineering: Civil or an NQF level 6
diploma or bachelor’s degree in Civil Engineering obtained from
a South African university.

Holders of any other equivalent South African or foreign quali-
fications may also be considered, but they will have to apply in
advance (± six months) for recognition of such qualifications.
Foreign students will be required to submit an evaluation by the
South African Qualifications Authority (SAQA) of their quali-
fications. The Faculty reserves the right to assess these qualifications
and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the
completion of certain additional subjects may be required.

b. Selection criteria: Selection is based on a personal interview with a departmental
selection panel.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes offered over a period of
two years).
Please note that the campus indicated is subject to change and
confirmation.


e. Intake for the qualification: January and July.


g. Accreditation by professional body: This qualification has been accredited by the Engineering
Council of South Africa (ECSA).

h. Subject credits: Subject credits are shown in brackets after each subject.

Please note:
Students must pass eight subjects. They must take a minimum of five subjects in their particular field
of specialisation, with the balance made up of subjects offered in the other fields of specialisation.
Subjects are offered as determined by the Head of the Department. The total credits of the Level IV
subjects may not be less than 0,500.

Construction Materials Technology IV may not be taken in combination with either Concrete
Technology IV or Asphalt Technology IV, or with both.

FIRST SEMESTER (2010)

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<tbody>
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<td>Structural Timber Design IV</td>
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SECOND SEMESTER (2010)

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<td>FDE401T</td>
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<tr>
<td>PCG401T</td>
<td>Pre-Stressed Concrete Design IV</td>
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FIRST SEMESTER (2011)

SAS401T Structural Analysis IV (0,125)
TSC411T Theory of Structures IV (0,125)

SECOND SEMESTER (2011)

SSE401T Structural Steel Design IV (0,125)
STM401T Structural Masonry Design IV (0,125)

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

4.8 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL:
TRANSPORTATION ENGINEERING
Qualification code: BTTO02

REMARKS

a. Admission requirement(s): A National Diploma: Engineering: Civil or an NQF level 6
diploma or bachelor’s degree in Civil Engineering obtained from
a South African university.

Holders of any other equivalent South African or foreign qual-
ifications may also be considered, but they will have to apply in
advance (± six months) for recognition of such qualifications.
Foreign students will be required to submit an evaluation by the
South African Qualifications Authority (SAQA) of their qualifica-
tions. The Faculty reserves the right to assess these qualifications
and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the
completion of certain additional subjects may be required.

b. Selection criteria: Selection is based on a personal interview with a departmental
selection panel.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes offered over a period of
two years).
Please note that the campus indicated is subject to change and
confirmation.

e. Intake for the qualification: January and July.


g. Accreditation by professional body: This qualification has been accredited by the Engineering
Council of South Africa (ECSA).

h. Subject credits: Subject credits are shown in brackets after each subject.

Please note:
Students must pass eight subjects. They must take a minimum of five subjects in their particular field
of specialisation, with the balance made up of subjects offered in the other fields of specialisation.
Subjects are offered as determined by the Head of the Department. The total credits of the Level IV
subjects may not be less than 0,500.

Construction Materials Technology IV may not be offered in combination with either Concrete
Technology IV or Asphalt Technology IV, or with both.
FIRST SEMESTER (2010)

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<tr>
<td>GDE401T</td>
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SECOND SEMESTER (2010)

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<td>TFE401T</td>
<td>Traffic Engineering IV</td>
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FIRST SEMESTER (2011)

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<tbody>
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<td>TSP401T</td>
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<td>TTN401T</td>
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SECOND SEMESTER (2011)

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<td>AHT401T</td>
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<tr>
<td>PTY401T</td>
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TOTAL CREDITS FOR THE QUALIFICATION: 1,000

### 4.9 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL: URBAN ENGINEERING

Qualification code: BTUB02

**REMARKS**

a. Admission requirement(s): A National Diploma: Engineering: Civil or an NQF level 6 diploma or bachelor’s degree in Civil Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Selection is based on a personal interview with a departmental selection panel.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes offered over a period of two years). Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.


g. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).
h. Subject credits: Subject credits are shown in brackets after each subject.

Please note:
Students must pass eight subjects. They must take a minimum of five subjects in their particular field of specialisation, with the balance made up of subjects offered in the other fields of specialisation. Subjects are offered as determined by the Head of the Department. The total credits of the Level IV subjects may not be less than 0,500.

Construction Materials Technology IV may not be taken in combination with either Concrete Technology IV or Asphalt Technology IV, or with both.

FIRST SEMESTER (2010)

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<td>GDE401T</td>
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<tr>
<td>KMT401T</td>
<td>Construction Materials Technology IV</td>
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SECOND SEMESTER (2010)

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<td>SWM401T</td>
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<td>UPD401T</td>
<td>Urban Planning and Design IV</td>
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FIRST SEMESTER (2011)

No subjects will be presented in this field of specialisation in this semester.

SECOND SEMESTER (2011)

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<th>CODE</th>
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<td>PTY401T</td>
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<tr>
<td>RDA401T</td>
<td>Reticulation Design and Management IV</td>
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</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

4.10 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: CIVIL: WATER ENGINEERING
Qualification code: BTCW02

REMARKS

a. Admission requirement(s): A National Diploma: Engineering: Civil or an NQF level 6 diploma or bachelor’s degree in Civil Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Selection is based on a personal interview with a departmental selection panel.
c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes offered over a period of two years). Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.


g. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

h. Subject credits: Subject credits are shown in brackets after each subject.

Please note: Students must pass eight subjects. They must take a minimum of five subjects in their particular field of specialisation, with the balance made up of subjects offered in the other fields of specialisation. Subjects are offered as determined by the Head of the Department. The total credits of the Level IV subjects may not be less than 0,500.

Construction Materials Technology IV may not be taken in combination with either Concrete Technology IV or Asphalt Technology IV, or with both.

**FIRST SEMESTER (2010)**

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<tr>
<th>CODE</th>
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<tbody>
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<td>HDL401T</td>
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<td>HYD401T</td>
<td>Hydrology IV</td>
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**SECOND SEMESTER (2010)**

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<tbody>
<tr>
<td>IRR401T</td>
<td>Irrigation IV</td>
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**FIRST SEMESTER (2011)**

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<tbody>
<tr>
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<tr>
<td>WWT401T</td>
<td>Wastewater Treatment Technology IV</td>
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**SECOND SEMESTER (2011)**

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<tbody>
<tr>
<td>PDE401T</td>
<td>Principles of Dam Engineering IV</td>
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<tr>
<td>RDA401T</td>
<td>Reticulation Design and Management IV</td>
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</table>

**TOTAL CREDITS FOR THE QUALIFICATION:** 1,000

**4.11 MAGISTER TECHNOLOGIAE: ENGINEERING: CIVIL**

Qualification code: MTCI95

**REMARKS**

a. Admission requirement(s): A Baccalaureus Technologiae: Engineering: Civil degree or an NQF level 7 bachelor’s or honours degree in Civil Engineering obtained from a South African university.
Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of one year and a maximum of three years.

d. Presentation and campus: Pretoria Campus (research).
   Please note that the campus indicated is subject to change and confirmation.

e. Content: This programme comprises a research project with a dissertation, subject to the student having already passed Research Methodology. In the dissertation, the student should prove that he or she understands a particular problem in the industry to which his or her research applies and is able to analyse it, set it out logically, arrive at logical conclusions or a diagnosis and make proposals for improvements or the elimination of the problem. The dissertation should comply with the usual general technical requirements and rules regarding scope, quality and layout.

f. Other requirement(s): Candidates who apply for admission to this qualification must provide the Head of the Department with a protocol (research proposal) for discussion.

g. Subject credits: Subject credits are shown in brackets after each subject.

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<tbody>
<tr>
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<tr>
<td>CVE500R</td>
<td>Dissertation: Engineering: Civil (re-registration)</td>
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TOTAL CREDITS FOR THE QUALIFICATION: 1,000

### 4.12 DOCTOR TECHNOLOGIAE: ENGINEERING: CIVIL
Qualification code: DTCI96

**REMARKS**

a. Admission requirement(s): A Magister Technologiae: Engineering: Civil or an NQF level 8 master’s degree in Civil Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign master’s degree may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.
b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of two years and a maximum of five years.

d. Presentation and campus: Pretoria Campus (research).
   Please note that the campus indicated is subject to change and confirmation.

e. Content: This programme comprises an advanced research project with a thesis. The thesis should give proof of the student’s original creative thinking and problem-solving abilities, and prove that he or she can make a real contribution in solving a particular problem in the industry to which the research applies. The dissertation should comply with the usual general technical requirements and rules regarding scope, quality and layout.

f. Other requirement(s): Candidates who apply for admission to this qualification, must provide the Head of the Department with a protocol (research proposal) for discussion.

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<tr>
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<tr>
<td>CVE700R</td>
<td>Thesis: Engineering: Civil (re-registration)</td>
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**Total Credits for the Qualification:** 2,000

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**4.13 SUBJECT INFORMATION**

Syllabus content subject to change to accommodate industry changes.

**SUBJECT NAME:** APPLIED GEOMECHANICS IV  
**SUBJECT CODE:** AGM401T  
**EVALUATION METHOD:** 1 X 3-HOUR PAPER (OPEN BOOK)  
**TOTAL TUITION TIME:** ± 32 hours  
**OVERVIEW OF SYLLABUS:** Soil mechanics: properties of soil, testing, site investigation. Lateral earth support. Buried structures. Ground improvement. In-situ tests. Project.

**SUBJECT NAME:** APPLIED MECHANICS I  
**SUBJECT CODE:** AME121T  
**EVALUATION METHOD:** 1 X 3-HOUR PAPER  
**TOTAL TUITION TIME:** ± 180 hours  
**OVERVIEW OF SYLLABUS:** The foundation provisions encompass a detailed and comprehensive general introduction to mechanics. Basic principles of mechanics in respect of measurements and different units and use of decimal figures. Basic introduction to mass, vectors, forces, moments, friction, hydraulics and motion of bodies. Implementation of Newton’s Laws and concepts of work, power and energy.

**SUBJECT NAME:** APPLIED MECHANICS I  
**SUBJECT CODE:** AME111T  
**EVALUATION METHOD:** 1 X 3-HOUR PAPER  
**TOTAL TUITION TIME:** ± 90 hours  
**OVERVIEW OF SYLLABUS:** Basics of structural engineering and hydraulics, mass, vectors, forces, properties of sections, friction. Various forms of motions of bodies, Newton’s laws, work and energy. Laboratory work.
SUBJECT NAME: ASPHALT TECHNOLOGY IV
SUBJECT CODE: AHT401T
EVALUATION METHOD: 1 X 4-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Rehabilitation. Applications and design. Influence of the traffic and the environment. Project.

SUBJECT NAME: COMMERCIAL LAW: CIVIL
SUBJECT CODE: CLC101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: COMMUNICATION SKILLS I
SUBJECT CODE: COS151T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
Specific, discipline-related interpretation, presentation and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. The students will be introduced to aspects of scaffolded reading as a tool to acquiring knowledge and interpretative abilities in their subject disciplines.

SUBJECT NAME: COMMUNICATION SKILLS I
SUBJECT CODE: COS101T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
Communication theory, non-verbal communication (body language). Oral presentations, interviews, developing leadership and participation skills. Technical reports and correspondence.

SUBJECT NAME: COMPUTER SKILLS I
SUBJECT CODE: CSK101E
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Components of a microcomputer system, engineering applications of software. Managing personal computers.

SUBJECT NAME: CONCRETE TECHNOLOGY IV
SUBJECT CODE: CCN401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONSTRUCTION MATERIALS I
SUBJECT CODE: CSM101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
The behaviour and characteristics of building materials, sampling, application of laboratory equipment and tests and the interpretation of results. Borrow-pit development, environmental awareness. Standards and codes of practice of materials, manufacturing and construction methods.
SUBJECT NAME: CONSTRUCTION MATERIALS TECHNOLOGY IV
SUBJECT CODE: KMT401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS: Concrete technology, asphalt and bitumen technology, other materials, testing.

SUBJECT NAME: CONSTRUCTION METHODS I
SUBJECT CODE: KME101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours

SUBJECT NAME: DOCUMENTATION III
SUBJECT CODE: DOC301T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 45 hours

SUBJECT NAME: DRAWING I
SUBJECT CODE: DRW101T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS: Drawing office practice. Introduction to draughtsmanship, projections (orthographic and isometric), intersections of surfaces, graphic determination of forces in frames, topographical drawings, SABS specification.

SUBJECT NAME: DRAWING II
SUBJECT CODE: DRW201T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS: Detailing structural steel members and connections. Detailing and preparation of bending schedules for reinforced concrete members. Drawing longitudinal and cross sections for roads, and road pavement details. Sections through structures, application of National Building Regulations.

SUBJECT NAME: EARTHWORKS DESIGN IV
SUBJECT CODE: EWD401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours

SUBJECT NAME: ENVIRONMENTAL ENGINEERING: CIVIL IV
SUBJECT CODE: ENR401T
EVALUATION METHOD: 2 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS: Environmental chemistry, environmental microbiology, ecology, environmental engineering, project.
SUBJECT NAME: ENVIRONMENTAL MANAGEMENT FOR ENGINEERS: CIVIL IV
SUBJECT CODE: ENN401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
ISO 14000, environmental impact assessment, integrated environmental management, environmental audits, case studies, project.

SUBJECT NAME: EXPERIENTIAL LEARNING I
SUBJECT CODE: EXP1ECI
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: Minimum of 24 weeks
OVERVIEW OF SYLLABUS:
Training on site or in the office of a contractor or consultant under the guidance of a mentor. Students must gain practical experience in civil engineering aspects, such as administration, drawing (CAD), design, surveying, construction supervision, contracts and geotechnical and laboratory work. A comprehensive report on the above must be submitted to the Head of the Department, for approval.

SUBJECT NAME: EXPERIENTIAL LEARNING II
SUBJECT CODE: EXP2ECI
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: Minimum of 24 weeks
OVERVIEW OF SYLLABUS:
Training on site or in the office of a contractor or consultant under the guidance of a mentor. Students must gain practical experience in civil engineering aspects, such as administration, drawing (CAD), design, surveying, construction supervision, contracts and geotechnical and laboratory work. A comprehensive report on the above must be submitted to the Head of the Department, for approval.

SUBJECT NAME: FINANCIAL MANAGEMENT III
SUBJECT CODE: FMN301T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION ACADEMIC SKILLS
SUBJECT CODE: FPACA01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
• The important aspects of life skills: Campus ethics, learning styles and whole-brain thinking, self-image and assertive behaviour, time management, self-motivation, conflict management, sexuality and relationships, problem-solving skills, managing stress, multicultural society, techniques for summarising and memorising, how to cope with assessments and assignments, creativity, and many more. The life-skills sessions are participative, with group discussions and personal application to optimise the student’s learning experience.
• The important aspects of English communication: Interpret, relate and reflect on all available and relevant resource material in proper English. Communicate orally in a comprehensible and clear manner in both general and subject-specific communication. Demonstrate intermediate-level proficiency in written English.
• An element of Computer Literacy is woven throughout the presentation of this subject as well as the Mathematics course. Students will be introduced to the basic functions of personal computing, Windows, word processors and other software, and engage in e-learning as a way of becoming familiar with this kind of technology.
SUBJECT NAME: FOUNDATION APPLIED MECHANICS I
SUBJECT CODE: FPAME01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION APPLIED SCIENCE
SUBJECT CODE: FPAPP01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
An introduction to physics, statics, dynamics and electricity, dealing with the following topics: Atom theory, electricity, magnetism and electromagnetism, inductors, capacitors, RLC networks. Basic concepts of atomic bonds, crystal structures and material properties. Control over properties by heat treatment, microstructure and phase diagrams. Measuring material properties with mechanical tests like tensile tests, hardness tests, impact tests, etc. General forming processes, plastic strain, strain hardening, hot working, cold working, recrystallisation. Properties and uses of the well-known non-ferrous alloys. The basic properties and behaviour of ceramics, polymers and compound materials. Measurements, mechanics, motion in one-dimension kinematics, laws of motion dynamics, kinetic theory of matter and properties of matter, introduction to the biological sciences, general laws of movement, mechanics, heat, hydrodynamics, electricity and magnetism, wave motion, and nuclear physics.

SUBJECT NAME: FOUNDATION COMMUNICATION SKILLS I
SUBJECT CODE: FPCOS02
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
Speaking and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. Communication theory, non-verbal communication (body language). Oral presentations, interviews, developing leadership and participation skills. Technical reports and correspondence.

SUBJECT NAME: FOUNDATION COMPUTER SKILLS I
SUBJECT CODE: FPCSK02
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
Students will be introduced to: operating systems (Windows environment), basic word-processing skills (MS-Word), spreadsheets (MS-Excel), presentations tools (PowerPoint), communications, connectivity, the internet and the Web, components of a microcomputer system, engineering applications of software and managing personal computers.

SUBJECT NAME: FOUNDATION CONSTRUCTION MATERIALS I
SUBJECT CODE: FPCSOM01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
Atoms, molecules and ions, chemical formulas and equations, the periodic table, chemical bonding, nomenclature of inorganic compounds, phases of matter, solutions, the rate of chemical reactions, equilibrium in chemical reactions, acids and bases, oxidation, reduction and electrochemical cells. The behaviour and characteristics of building materials, sampling, application of laboratory equipment and tests and the interpretation of results. Borrow-pit development, environmental awareness. Standards and codes of practice of materials, manufacturing and construction methods.
SUBJECT NAME: FOUNDATION DRAWING I
SUBJECT CODE: FPDRW01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Lettering, line work and freehand sketches, geometric constructions, fasteners, dimensioning, methods of projections, sectioning, interpenetration curves and pipe developments, conversions: imperial to metric, terms and abbreviations used in engineering drawing, piping diagrams. Drawing office practice. Introduction to draughtsmanship, projections (orthographic and isometric), intersections of surfaces, graphic determination of forces in frames, topographical drawings, SABS specification.

SUBJECT NAME: FOUNDATION ENGINEERING
SUBJECT CODE: FPEGI01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
An introduction to technical drawing as well as the type of skills, workplace environments and knowledge required in all the major fields of engineering that are practised in the South African economy.

SUBJECT NAME: FOUNDATION ENGINEERING IV
SUBJECT CODE: FDE401T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Shallow and deep foundation design, lateral earth support.

SUBJECT NAME: FOUNDATION MATHEMATICS
SUBJECT CODE: FPMAT05
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
Basic algebra, functions, exponents and logarithm, differential calculus, trigonometry, geometry. Basic mathematics. Differentiation. Integration. Matrices and determinants. Vectors. Data handling. Complex numbers or mensuration. Students will be introduced to personal computers, Windows and e-learning technologies as a fundamental part of this subject.

SUBJECT NAME: FOUNDATION MATHEMATICS I
SUBJECT CODE: FPMAT04
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION SURVEYING: PRACTICAL I
SUBJECT CODE: FPSURZT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 200 hours
OVERVIEW OF SYLLABUS:
Introduction to engineering (chemical, metallurgical, civil, surveying, electrical, clinical, digital technology, high-frequency technology, power engineering, process instrumentation, mechanical, industrial, mechatronics), factory safety, measurements, engineering materials, projects. Setting up and levelling of the level and theodolite. Taking levelling readings and compiling the field book, testing and adjusting the different levelling instruments, testing and adjusting the theodolite, distance measurement with a tape, individual levelling line of at least 600 m and testing it, levelling of longitudinal section of at least 300 m and the transverse sections at every 20 m interval in group context. Individual traverse with at least three legs. Calculation and correction of traverse, topographic surveying of demarcated area. Drawing a plan and interpreting the contours.
SUBJECT NAME: FOUNDATION SURVEYING: THEORY I
SUBJECT CODE: FPSURYT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 150 hours
OVERVIEW OF SYLLABUS:
Introduction to engineering (chemical, metallurgical, civil, surveying, electrical, clinical, digital technology, high-frequency technology, power engineering, process Instrumentation, mechanical, industrial, mechatronics), factory safety, measurements, engineering materials, projects. Geometrical principles, trigonometry, applications and uses of trigonometry in surveying, spherical triangles, indication of point position on the surface of the earth, coordinate geometry, South African coordinate system. Calculation of joins and polars. Distance measurement and improvements of tape measurements, manipulation of formulas, order sizes, identities, arithmetic and mental arithmetic, calculation of surfaces and volumes of straight and curved figures, conversion of levelling readings.

SUBJECT NAME: GEOLOGY: CIVIL IV
SUBJECT CODE: GEC401T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Advanced engineering geology, rock mechanics, geotechnical instrumentation, geophysical methods.

SUBJECT NAME: GEOMETRIC DESIGN IV
SUBJECT CODE: GDE401T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Principles and practice of road alignment, environmental impact control, design control and criteria, elements of design (geometric, safety), intersection and interchange design, drainage design, earthworks design, design project.

SUBJECT NAME: GEOTECHNICAL ENGINEERING II
SUBJECT CODE: GTE201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: GEOTECHNICAL ENGINEERING III
SUBJECT CODE: GTE301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: HYDRAULICS IV
SUBJECT CODE: HDL401T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Hydrodynamics, hydraulic machinery (pumps, turbines, etc.), hydraulic models. Open-channel hydraulics, fluvial hydraulics, wave hydraulics.
SUBJECT NAME: HYDROGEOLOGY III
SUBJECT CODE: HGE301B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Basic concepts, the principles of groundwater hydraulics. Pumping tests and the measurement of spring and river flow. Groundwater replenishment and the rudiments of determining groundwater reserves. Hydrochemistry, water quality requirements and an introduction to the quality of South African groundwater. The water-bearing properties of South African rock groups. Geological and geophysical investigations for borehole siting.

SUBJECT NAME: HYDROLOGY IV
SUBJECT CODE: HYD401T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Introduction to meteorology, groundwater, surface water, water resources analysis, South African hydrology.

SUBJECT NAME: INDUSTRIAL RELATIONS AND NEGOTIATION II
SUBJECT CODE: IRN201B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Industrial relations. Strike management. Negotiation and dispute handling in the following:
- Contractor/client and contractor/subcontractor relations
- Contractor/professional team relations
- Management/personnel relations
- Project manager/other parties relations

SUBJECT NAME: IRRIGATION IV
SUBJECT CODE: IRR401T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Soil water and plant irrigation, types of systems. Irrigation scheduling, irrigation design (feasibility studies), irrigation in South Africa, environmental impact of irrigation, design project.

SUBJECT NAME: MANAGEMENT: CIVIL I
SUBJECT CODE: MNC101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 45 hours
OVERVIEW OF SYLLABUS:
Composition of the civil engineering industry. Types of contracts, tenders, management principles, productivity. Office and site administration, quality control. Elementary economics and financial accounting.

SUBJECT NAME: MANAGEMENT: CIVIL II
SUBJECT CODE: MNC201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: MANAGEMENT PRINCIPLES AND PRACTICE IV
SUBJECT CODE: MPP401B
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MATHEMATICS I
SUBJECT CODE: MAT181T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive introduction to the theorems and applications of the differential calculus, trigonometry, algebra and matrices. Elementary data handling and vector calculations are also introduced with practical introductions to the applications specific to the engineering discipline in which the student is registered.

SUBJECT NAME: MATHEMATICS I
SUBJECT CODE: MAT171T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MATHEMATICS II
SUBJECT CODE: MAT281T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
A more in-depth study of the applications of differential and integral calculus in the engineering field, with use of technology and software to solve discipline specific problems. A more advanced treatment of matrix calculations and their applications will also be covered.

SUBJECT NAME: MATHEMATICS II
SUBJECT CODE: MAT271T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: PAVEMENT TECHNOLOGY IV
SUBJECT CODE: PTY401T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Pavement design factors (gravel, flexible, rigid), pavement construction (gravel, flexible, rigid), pavement assessment and rehabilitation, pavement management, project.

SUBJECT NAME: PRE-STRESSED CONCRETE DESIGN IV
SUBJECT CODE: PCG401T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Design of pre-stressed concrete structures, computer applications.
<table>
<thead>
<tr>
<th>SUBJECT NAME:</th>
<th>PRINCIPLES OF DAM ENGINEERING IV</th>
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<tbody>
<tr>
<td>SUBJECT CODE:</td>
<td>PDE401T</td>
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<tr>
<td>EVALUATION METHOD:</td>
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<td>TOTAL TUITION TIME:</td>
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<tr>
<td>OVERVIEW OF SYLLABUS:</td>
<td>Geological and foundation considerations, design principles, dam safety, seepage, grouting and drainage, project.</td>
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<tr>
<th>SUBJECT NAME:</th>
<th>PROJECT MANAGEMENT: CIVIL IV</th>
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<tr>
<td>SUBJECT CODE:</td>
<td>PJG401T</td>
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<tr>
<td>EVALUATION METHOD:</td>
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<tr>
<th>SUBJECT NAME:</th>
<th>REINFORCED CONCRETE AND MASONRY DESIGN III</th>
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<tbody>
<tr>
<td>SUBJECT CODE:</td>
<td>RCM301T</td>
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<tr>
<td>EVALUATION METHOD:</td>
<td>1 X 4-HOUR PAPER (OPEN BOOK)</td>
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<td>TOTAL TUITION TIME:</td>
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<td>RCD401T</td>
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<tr>
<td>EVALUATION METHOD:</td>
<td>1 X 4-HOUR PAPER (OPEN BOOK)</td>
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<td>TOTAL TUITION TIME:</td>
<td>± 32 hours</td>
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<tr>
<td>OVERVIEW OF SYLLABUS:</td>
<td>Design of reinforced concrete structures, computer applications.</td>
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<tr>
<th>SUBJECT NAME:</th>
<th>RETICULATION DESIGN AND MANAGEMENT IV</th>
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<tbody>
<tr>
<td>SUBJECT CODE:</td>
<td>RDA401T</td>
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<tr>
<td>EVALUATION METHOD:</td>
<td>1 X 3-HOUR PAPER (OPEN BOOK)</td>
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<td>TOTAL TUITION TIME:</td>
<td>± 32 hours</td>
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<tr>
<td>OVERVIEW OF SYLLABUS:</td>
<td>This subject covers water, wastewater and stormwater reticulation systems: hydraulic principles, design parameters, ancillary works, pumping installations, system operation, water management, waste management, environmental aspects. Design project(s).</td>
</tr>
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<tr>
<th>SUBJECT NAME:</th>
<th>SOCIAL ENVIRONMENTAL STUDIES: CIVIL IV</th>
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<tr>
<td>SUBJECT CODE:</td>
<td>SIA401T</td>
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<tr>
<td>EVALUATION METHOD:</td>
<td>2 X 3-HOUR PAPER</td>
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<td>TOTAL TUITION TIME:</td>
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<tr>
<th>SUBJECT NAME:</th>
<th>SOIL AND GROUND WATER POLLUTION: CIVIL IV</th>
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<tr>
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<td>SOI401T</td>
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<td>EVALUATION METHOD:</td>
<td>1 X 3-HOUR PAPER</td>
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<td>TOTAL TUITION TIME:</td>
<td>± 32 hours</td>
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<tr>
<td>OVERVIEW OF SYLLABUS:</td>
<td>Sources of pollution, fluid flow and the transport of solute in porous media, remediation of contaminated groundwater, sanitation of polluted soils. Project.</td>
</tr>
</tbody>
</table>
SUBJECT NAME: SOLID WASTE MANAGEMENT IV
SUBJECT CODE: SWM401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: STRUCTURAL ANALYSIS II
SUBJECT CODE: SAS201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
The analysis of elementary structures for structural design purposes, calculation of bending moments, shear forces and deflections, pin-jointed frames, three-pinned structures, struts, combined stresses. Laboratory work.

SUBJECT NAME: STRUCTURAL ANALYSIS III
SUBJECT CODE: SAS301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
The analysis of complex structures for structural design purposes. Calculation of bending moments, shear forces and deflections for propped cantilevers, continuous beams, portal frames. Moment distribution, plastics theory. Laboratory work.

SUBJECT NAME: STRUCTURAL ANALYSIS IV
SUBJECT CODE: SAS401T
EVALUATION METHOD: 1 X 4-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Advanced structural analysis methods, applicable computer applications.

SUBJECT NAME: STRUCTURAL MASONRY DESIGN IV
SUBJECT CODE: STM401T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Design of unreinforced and reinforced structural masonry structures. Detailing.

SUBJECT NAME: STRUCTURAL STEEL AND TIMBER DESIGN III
SUBJECT CODE: SST301T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Design of steel structures, beams, plate girders, connections (bolted and welded), trusses, columns, composite columns. Timber design, element design as for steel, form work and support systems. Design projects.

SUBJECT NAME: STRUCTURAL STEEL DESIGN IV
SUBJECT CODE: SSE401T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Design of structural steel structures, computer applications.
SUBJECT NAME: STRUCTURAL TIMBER DESIGN IV
SUBJECT CODE: STD401T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Design of timber structures. Computer applications.

SUBJECT NAME: SURVEYING: CIVIL: PRACTICAL II
SUBJECT CODE: SUC20YT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 40 hours
OVERVIEW OF SYLLABUS:
Determining points for staking out roads by means of a traverse, identifying and output of a defined suggested centre line for constructing a road that includes a simple curve. Calculation and placing of geometrical data. Calculation and setting out of the centre line at 20 m intervals for the straight line, as well as the curve. Levelling and check levelling of the longitudinal and cross sections. Drawing of L/S and x sections, calculation and setting out of profile and site slope pegs according to formation line on L/S, with consideration of underground drainage. Calculation and setting out of drainage pipe underneath road.

SUBJECT NAME: SURVEYING: CIVIL: THEORY II
SUBJECT CODE: SUC20XT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 45 hours
OVERVIEW OF SYLLABUS:
EAM and lasers. Levelling, reciprocal and reverse levelling, longitudinal and transverse sections, setting out profiles and site-slope pegs, area and strip surveying, planning and setting out projects, construction measurements, horizontal curve calculations and setting out procedures.

SUBJECT NAME: SURVEYING: PRACTICAL I
SUBJECT CODE: SUR11ZT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 100 hours
OVERVIEW OF SYLLABUS:
Setting up and levelling of the level and theodolite. Taking levelling readings and compiling the field book, testing and adjusting the different levelling instruments, testing and adjusting the theodolite, distance measurement with a tape, individual levelling line of at least 600 m and testing it, levelling of longitudinal section of at least 300 m and the transverse sections at every 20 m interval in group context. Individual traverse with at least three legs. Calculation and correction of traverse, topographic surveying of demarcated area. Drawing a plan and interpreting the contours.

SUBJECT NAME: SURVEYING: THEORY I
SUBJECT CODE: SUR11YT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 75 hours
OVERVIEW OF SYLLABUS:
Geometrical principles, trigonometry, applications and uses of trigonometry in surveying, spherical triangles, indication of point position on the surface of the earth, coordinate geometry, South African coordinate system. Calculation of joins and polars. Distance measurement and improvements of tape measurements, manipulation of formulas, order sizes, identities, arithmetic and mental arithmetic, calculation of surfaces and volumes of straight and curved figures, conversion of levelling readings.

SUBJECT NAME: THEORY OF STRUCTURES II
SUBJECT CODE: TSC221T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 150 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to theory of structures. Basic principles of mechanics in respect of measurements and different units, concentrating on a more in-depth study of the applications of simple stress and strain, shear forces and bending moment graphs.
SUBJECT NAME: THEORY OF STRUCTURES II  
SUBJECT CODE: TSC211T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 75 hours  
OVERVIEW OF SYLLABUS: 
Elementary structural analysis, calculation of sectional properties, that is centroids, moment of inertia, etc. Stresses and strains of structural materials, theory of elastic bending. Calculations of bending moments, shear forces, deflections. Loads on structures.

SUBJECT NAME: THEORY OF STRUCTURES IV  
SUBJECT CODE: TSC411T  
EVALUATION METHOD: 1 X 4-HOUR PAPER  
TOTAL TUITION TIME: ± 32 hours  
OVERVIEW OF SYLLABUS: 
Advanced structural analysis methods, applicable computer applications.

SUBJECT NAME: TRAFFIC ENGINEERING IV  
SUBJECT CODE: TFE401T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 32 hours  
OVERVIEW OF SYLLABUS: 
Traffic surveys. Traffic characteristics and flow theory. Traffic design, traffic management and urban works, traffic safety, statistical methods, parking studies, systems and structures. Traffic systems management, traffic impact studies, traffic control and forms of signing, signals and automated traffic control systems, interchange and intersection capacities. Project.

SUBJECT NAME: TRANSPORTATION ENGINEERING II  
SUBJECT CODE: TEN201T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 60 hours  
OVERVIEW OF SYLLABUS: 
Transport planning, methods of transport, transport demand. Traffic engineering, traffic flow theory, traffic studies, parking layout, safety. Geometric design, horizontal and vertical alignment of roads and railroads, basic planning, detail design, supervision.

SUBJECT NAME: TRANSPORTATION ENGINEERING III  
SUBJECT CODE: TEN301T  
EVALUATION METHOD: 1 X 4-HOUR PAPER  
TOTAL TUITION TIME: ± 75 hours  
OVERVIEW OF SYLLABUS: 
Design of earthworks for roads and railroads. Materials requirements and selection for road construction, design methods for various classes of pavements, pavement layers, standard specifications. Road drainage requirements and drainage systems.

SUBJECT NAME: TRANSPORTATION PLANNING IV  
SUBJECT CODE: TSP401T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 32 hours  
OVERVIEW OF SYLLABUS: 
Planning theory and technique, transport models, data retrieval, assessment, environmental planning and characterisation, development control, route planning, transport impact studies. Project.

SUBJECT NAME: TRANSPORTATION TECHNOLOGY IV  
SUBJECT CODE: TTN401T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 32 hours  
OVERVIEW OF SYLLABUS: 
Transport policies, transportation systems, terminals, public transport, private transport, freight transport, vehicle and driver characteristics. Project.
SUBJECT NAME: URBAN PLANNING AND DESIGN IV
SUBJECT CODE: UPD401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Planning: historical perspective, modern trends, land-use, legal procedure, urban infrastructure, maintenance. Design: structure plans, township establishment, informal project design, emphasising the engineering-related aspects of urban planning and design.

SUBJECT NAME: WASTEWATER TREATMENT TECHNOLOGY IV
SUBJECT CODE: WWT401T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Wastewater properties, treatment processes, treatment plant design, environmental factors, plant operation and management. Design project.

SUBJECT NAME: WATER ENGINEERING II
SUBJECT CODE: WEN201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Basic principles of hydraulics, pressures, pipe flow, design of elementary pipe reticulation networks. Pump applications. Water quality, elementary design of water purification works and wastewater treatment plants, legislation.

SUBJECT NAME: WATER ENGINEERING III
SUBJECT CODE: WEN301T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Hydrology cycle, precipitation, evaporation, hydrographs. Stormwater management, calculation of run-off water. Open-channel flow, clear-water storage, sewerage reticulation, pump installations and pumping mains.

SUBJECT NAME: WATER RESOURCE MANAGEMENT: CIVIL IV
SUBJECT CODE: WAT401T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Water resources, river engineering, limnological aspects, estuaries aspects, water quality modelling, catchment management, project.

SUBJECT NAME: WATER TREATMENT TECHNOLOGY IV
SUBJECT CODE: WTT401T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Properties of water, treatment processes, treatment site design, recalculation, re-use, recovery and conservation of water, environmental factors.
5. **DEPARTMENT OF ELECTRICAL ENGINEERING**

**GENERIC STIPULATIONS WITH REGARD TO THE QUALIFICATIONS ISSUED:**

**Offering of qualifications**

The purpose of the qualification, as specified in this section, is to train and qualify top-quality technicians, technologists and engineers in the field of electrical engineering in South Africa. On completion of his/her studies, the student can receive the National Diploma: Engineering: Electrical after three years of study. After completing a further year of study, the Baccalaureus Technologiae: Engineering: Electrical will be awarded. Provision is, however, made for students to orient themselves towards a particular field of specialisation. Detailed descriptions of careers related to each specialisation field are given. All the qualifications include experiential learning components in industry through appropriate cooperative agreements with specific companies in the industrial and service sectors in South Africa.

Students can enrol for various postgraduate degrees at the Magister Technologiae and Doctor Technologiae level. The Graduate School in Electrical and Electronic Engineering (GSEE) currently coordinates all postgraduate qualifications (M Tech, MSc, D Tech) and it is managed by the Department of Electrical Engineering at the Pretoria Campus. A Master’s of Science (MSc) in Electronics and a Master’s of Science (MSc) in Power Engineering is also offered in association with ESIEE, Amiens, France. Credits can be awarded towards these degrees while being enrolled for the Magister and Doctor Technologiae in Electrical Engineering at TUT. Simultaneous credits (double accreditation) can thus be obtained for some qualifications at this level.

All the qualifications currently offered by the Department of Electrical Engineering at the Tshwane University of Technology are fully accredited by the Engineering Council of South Africa (ECSA), as well as the South African Qualifications Authority (SAQA). After a student has completed his or her studies, he or she may apply for professional registration at ECSA. Registration with ECSA gives the qualification international status and recognition in other countries through the current Sydney and Dublin Accords.

**Enrolment**

All first-year students enrol for the National Diploma: Engineering: Electrical, as outlined below.

The work of an engineering professional general includes the following:


ii. Management and communication – individually and in the working environment, and specific to the discipline and target industry.

iii. Application of engineering and ethical work practice – including evaluation of ability, competency and work of oneself and of others.

**The purpose of the National Diploma: Engineering: Electrical includes the following:**

- Use and interpretation of mathematical formulas used in engineering calculations
- The ability to perform statistical analyses by using standard methods and evaluation
- Interpretation and evaluation of results
- Use of basic scientific principles in engineering
- Engineering science applicable to the appropriate subdiscipline
- Knowledge that addresses the target industry’s specific needs
- Formative education, which includes critical cross-field outcomes through a cooperative education system in which full integration of experiential learning in a real-life industrial environment complements the independent academic, classroom and integrated laboratory work
- Development of manipulative and functional skills
- Development of a culture of self-learning and the continuing acquisition of knowledge and skills that are necessary to perform in a developing work environment solution of real and industrial problems through the application of currently known technology
- Integration of technical knowledge and skills to develop thinking skills that equip the learner to achieve the desired results through the qualification

**GENERIC OUTCOMES OF THE NATIONAL DIPLOMA: ENGINEERING: ELECTRICAL**

**Exit-level outcome 1: Problem-solving**

Apply engineering principles to systematically diagnose and solve well-defined engineering problems.
Exit-level outcome 2: Application of scientific and engineering knowledge
Demonstrate the application of mathematical, scientific and engineering knowledge in an engineering environment.

Exit-level outcome 3: Engineering design
Perform procedural design of well-defined components, systems, works, products or processes to meet desired needs within applicable standards, codes of practice and legislation.

Exit-level outcome 4: Communication
Communicate technical, supervisory and general management information effectively, both orally and in writing, by using appropriate language and terminology, structure, style and graphical support.

Exit-level outcome 5: Engineering management
Apply self-management principles and concepts to the development of projects and/or operations in an engineering environment.

Exit-level outcome 6: Application of complementary knowledge
Demonstrate a critical awareness of the impact of engineering activity on the social, industrial and physical environment, and of the need to act professionally within own limits of competence.

The purpose of the Baccalaureus Technologiae: Engineering: Electrical includes the following (conforming to the requirements specified by ECSA):

- Use of mathematics to solve technical problems
- Support reasoning in technical subjects
- Evaluation of results of calculations
- The ability to perform statistical analyses
- Basic science that focuses on the needs of specialist technology areas and supports reasoning concerning engineering phenomena
- Engineering science that focuses on knowledge relating to specialist fields in relevant areas and supports interaction with other specialists and generalists
- At least 30% of the qualification is based on project work, involving the solution of real, industrial and applied problems, using fundamental principles that underpin current technology
- Analytical thinking and technical and managerial skills are used in the application of knowledge used in solving complex problems
- The development of initiatives that will lead to obtaining additional knowledge and skills that will ensure the advancement of technology

GENERIC OUTCOMES OF THE BACCALAUREUS TECHNOLOGIAE: ENGINEERING: ELECTRICAL

Exit-level outcome 1: Problem-solving
Apply engineering principles to systematically diagnose and solve broadly defined engineering problems.

Exit-level outcome 2: Application of scientific and engineering knowledge
Demonstrate the application of mathematical, scientific and engineering knowledge in an engineering environment.

Exit-level outcome 3: Engineering Design
Perform procedural and non-procedural design of broadly defined components, systems, works, products or processes to meet desired needs within applicable standards, codes of practice and legislation.

Exit-level outcome 4: Communication
Communicate technical, supervisory and general management information effectively, both orally and in writing, by using appropriate language and terminology, structure, style and graphical support.

Exit-level outcome 5: Engineering management
Apply engineering management principles and concepts to engineering activities.

Exit-level outcome 6: Project development
Identify, analyse, conduct and manage a project.
Exit-level outcome 7: Application of complementary knowledge
Demonstrate a critical awareness of the impact of engineering activity on the social, industrial and physical environment, and of the need to act professionally within own limits of competence.

The critical cross-field outcomes of the National Diploma and the Baccalaureus Technologiae: Engineering: Electrical are as follows:
• Identify and solve problems that display responsible decisions, using critical and creative thinking
• Work effectively with others as a member of a team, group, organisation and community
• Organise and manage one's activities responsibly and effectively
• Collect, analyse, organise and critically evaluate information
• Communicate effectively, using visual, mathematical and/or language skills in the modes of oral and/or written persuasion
• Use science and technology effectively and critically, showing responsibility towards the environment and health of others
• Demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation

5.1 NATIONAL DIPLOMA: ENGINEERING: ELECTRICAL (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)
(Pending final approval – DoE)
Qualification code: NDEEF1

REMARKS
a. Admission requirement(s) and selection criteria:

• FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:
  Admission requirement(s): A Senior Certificate or an equivalent qualification, with F symbols at the Higher Grade or E Symbols at the Standard Grade for English, Mathematics and Physical Sciences.
  Recommended subject(s): None.
  Selection criteria: Prospective students who meet the above requirements, will sit for an admission test. Admission to either the formal qualification or a preparation programme is determined by a combination of the results of the admission test and the Senior Certificate marks. The offer to a prospective student of a place expires six months after the date on which the admission test is written.

• FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:
  See qualification NDEE03.

b. Minimum duration: Four years.
c. Presentation and campuses: eMalahleni and Pretoria campuses (day classes). Please note that the campuses indicated are subject to change and confirmation.
d. Intake for the qualification: January and July.
e. Readmission: See Chapter 3 of Students’ Rules and Regulations.
f. Additional costs: While it is the University’s policy to keep class fees and additional costs as low as possible, it should be stated that students will be expected to supply and purchase their own writing paper, pencils and pens, the required textbooks, multimeters, breadboards and calculators. Personal computers are highly recommended.

h. Experiential Learning I and II: See Chapter 5 of Students’ Rules and Regulations.

i. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPACA01</td>
<td>Foundation Academic Skills</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>FPAPP01</td>
<td>Foundation Applied Science</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>FPEGI01</td>
<td>Foundation Engineering</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>FPMAT05</td>
<td>Foundation Mathematics</td>
<td>(0,050)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,250

SECOND SEMESTER

After completing all of the above subjects.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
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</thead>
<tbody>
<tr>
<td>COS151T</td>
<td>Communication Skills I</td>
<td>(0,050)</td>
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</tr>
<tr>
<td>EEN141T</td>
<td>Electrical Engineering I</td>
<td>(0,100)</td>
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</tr>
<tr>
<td>ELC131T</td>
<td>Electronics I</td>
<td>(0,100)</td>
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<tr>
<td>MAT181T</td>
<td>Mathematics I</td>
<td>(0,100)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,350

TOTAL CREDITS FOR THE FIRST YEAR: 0,600

SECOND YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
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</thead>
<tbody>
<tr>
<td>CSK101C</td>
<td>Computer Skills I</td>
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<td>DSY151T</td>
<td>Digital Systems I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>ESL111T</td>
<td>Engineering Science I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>MAT281T</td>
<td>Mathematics II</td>
<td>(0,100)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>PJT101T</td>
<td>Projects I</td>
<td>(0,090)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,440

SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSY231T</td>
<td>Digital Systems II</td>
<td>(0,090)</td>
<td>Digital Systems I</td>
</tr>
<tr>
<td>EEN211T</td>
<td>Electrical Engineering II</td>
<td>(0,090)</td>
<td>Electrical Engineering I</td>
</tr>
<tr>
<td>ELC211T</td>
<td>Electronics II</td>
<td>(0,090)</td>
<td>Electronics I</td>
</tr>
<tr>
<td>SFD201T</td>
<td>Software Design II</td>
<td>(0,090)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,360

TOTAL CREDITS FOR THE SECOND YEAR: 0,800
THIRD YEAR

FIRST SEMESTER

MAT351T Mathematics III (0,100) Mathematics II

plus three of the following subjects (to orient to a specific field in Electrical Engineering, students should consult the subject selection guide at the end of 5.3). Subjects are offered at the location determined by the Head of the Department:

BIS101T Bio-Systems I (0,100) Electrical Engineering II
EEN311T Electrical Engineering III (0,100) Electrical Engineering II
ELC331T Electronics III (0,100) Electronics II
EMA241T Electrical Machines II (0,100) Electronics II
ETC221T Electronic Communication II (0,100) Electronics II
MDR101T Mechanical Engineering Drawing I (0,100) Electronics II
MEQ211T Medical Equipment II (0,100) Medical Equipment II
MHC101T Mechanics I (0,100) Medical Equipment II
PCM221T Process Instrumentation II (0,100) Engineering Science I

TOTAL CREDITS FOR THE SEMESTER: 0,400

SECOND SEMESTER

DPJ301T Design Project III (0,100) Digital Systems II

plus three of the following subjects (to orient to a specific field in Electrical Engineering, students should consult the subject selection guide at the end of 5.3). Subjects are offered at the location determined by the department:

DCO201T Digital Communication II (0,100) Mathematics III
CSY321T Control Systems III (0,100) Digital Systems II
DSY341T Digital Systems III (0,100) Digital Systems II
ELD331T Electrical Distribution III (0,100) Electrical Engineering II
EMA341T Electrical Machines III (0,100) Electrical Machines II
EPC321T Electrical Protection III (0,100) Electrical Engineering II
ETC301T Electronic Communication III (0,100) Electronic Communication II
LOD311T Logic Design III (0,100) Digital Systems II
MEQ331T Medical Equipment III (0,100) Bio-Systems I
MEQ33XT Medical Equipment: Equipment III** (0,100) Medical Equipment II
MEQ33YT Medical Equipment: Systems III** (0,100) Medical Equipment II

TOTAL CREDITS FOR THE SEMESTER: 0,400

TOTAL CREDITS FOR THE THIRD YEAR: 0,800
FOURTH YEAR

FIRST SEMESTER

EXP1EEH  Experiential Learning I  (0,400)

TOTAL CREDITS FOR THE SEMESTER:  0,400

SECOND SEMESTER

EXP2EEH  Experiential Learning II  (0,400)

TOTAL CREDITS FOR THE SEMESTER:  0,400

TOTAL CREDITS FOR THE FOURTH YEAR:  0,800

5.2 NATIONAL DIPLOMA: ENGINEERING: ELECTRICAL (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)
(Pending final approval – Senate)

Qualification code: NDEEF0

NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2009. STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL 2014 TO OBTAIN IT, SUBJECT TO THE STIPULATIONS OF REGULATION 3.1.1 ON THE MAXIMUM DURATION OF STUDY.

Phase-out date: 31 December 2014

Presentation and Campus:
Pretoria Campus (day classes).
Please note that the campus indicated is subject to change and confirmation.

Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

FIRST YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPCOS02</td>
<td>Foundation Communication Skills I</td>
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<tr>
<td>FPCSK02</td>
<td>Foundation Computer Skills I</td>
<td>(0,050)</td>
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<tr>
<td>FPEEN01</td>
<td>Foundation Electrical Engineering I</td>
<td>(0,100)</td>
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<td>FPELC01</td>
<td>Foundation Electronics I</td>
<td>(0,100)</td>
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<tr>
<td>FPESL01</td>
<td>Foundation Engineering Science I</td>
<td>(0,100)</td>
</tr>
<tr>
<td>FPMAT04</td>
<td>Foundation Mathematics I</td>
<td>(0,100)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE FIRST YEAR:  0,500

As from the second year, students will continue with the subjects of the second semester of the qualification NDEE03. Students will still register for the qualification code NDEEF0. Students will not be permitted to continue with the subjects of the second semester of the first year if they have not passed all the subjects of the foundation year.
REMARKS

a. Admission requirement(s):

For students who obtained a Senior Certificate before 2008:
A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics and an E symbol at the Higher Grade or a D symbol at the Standard Grade for Physical Science.

For students who have obtained a National Senior Certificate since 2008:
A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

b. Recommended subject(s): None.

c. Selection criteria:

Admission Point Score (APS) and assessment procedures:

Candidates with an APS score of 24+ will be admitted to the National Diploma or the National Diploma (Extended Curriculum). A candidate's performance in an academic placement test written in January as part of the Faculty's orientation programme will determine whether he or she will be channelled to the National Diploma or National Diploma (Extended Curriculum).

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
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<tbody>
<tr>
<td>7</td>
<td>A</td>
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<tr>
<td>6</td>
<td>B</td>
<td>A</td>
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<td>5</td>
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<td>3</td>
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<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)

FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
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</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL APS SCORE (six subjects, excluding Life Orientation) 24

d. Minimum duration: Three years.
Presentation and campus: eMalahleni and Pretoria campuses (day or evening classes, subject to a sufficient number of students). Nelspruit Campus (day classes - no new intake at this campus as from 2009). Soshanguve South Campus (day or evening classes, subject to a sufficient number of students - no new intake at this campus as from 2009). Please note that the campuses indicated are subject to change and confirmation.

Intake for the qualification: January and July.

Readmission: See Chapter 3 of Students’ Rules and Regulations.

Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

Additional costs: While it is the University’s policy to keep class fees and additional costs as low as possible, it should be stated that students will be expected to supply and purchase their own writing paper, pencils and pens, the required textbooks, multimeters, breadboards and calculators. Personal computers are highly recommended.


Experiential Learning I and II: See Chapter 5 of Students’ Rules and Regulations.

Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks:
* Information does not correspond to information in Report 151.
(Deviations approved by the Senate in May 2008.)
** MEQ33XT and MEQ33YT must be taken concurrently and will count as one subject.

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECTS(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COS101T</td>
<td>Communication Skills I</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>CSK101C</td>
<td>Computer Skills I</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>EEN111T</td>
<td>Electrical Engineering I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>ELC111T</td>
<td>Electronics I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>ESL111T</td>
<td>Engineering Science I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
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<td></td>
<td>TOTAL CREDITS FOR THE SEMESTER:</td>
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SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
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<th>CREDIT</th>
<th>PREREQUISITE SUBJECTS(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSY131T</td>
<td>Digital Systems I</td>
<td>(0,100)</td>
<td>Electrical Engineering I or Foundation Electrical Engineering I</td>
</tr>
<tr>
<td>EEN211T</td>
<td>Electrical Engineering II</td>
<td>(0,100)</td>
<td>Electronics I or Foundation Electronics I</td>
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<td>ELC211T</td>
<td>Electronics II</td>
<td>(0,100)</td>
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<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0,100)</td>
<td>Mathematics I or Foundation Mathematics I</td>
</tr>
<tr>
<td>PJT101T</td>
<td>Projects I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL CREDITS FOR THE SEMESTER:</td>
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<tr>
<td></td>
<td>TOTAL CREDITS FOR THE FIRST YEAR:</td>
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SECOND YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT351T</td>
<td>Mathematics III</td>
<td>(0,100)</td>
</tr>
<tr>
<td>SFD201T</td>
<td>Software Design II</td>
<td>(0,100)</td>
</tr>
</tbody>
</table>

plus three of the following subjects (to orient to a specific field in Electrical Engineering, students should consult the subject selection guide at the end of this qualification). Subjects are offered at the location determined by the department:

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIS101T</td>
<td>Bio-Systems I</td>
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</tr>
<tr>
<td>DCO201T</td>
<td>Digital Communication II</td>
<td>(0,100)</td>
</tr>
<tr>
<td>DSY231T</td>
<td>Digital Systems II</td>
<td>(0,100)</td>
</tr>
<tr>
<td>EEN311T</td>
<td>Electrical Engineering III</td>
<td>(0,100)</td>
</tr>
<tr>
<td>EMA241T</td>
<td>Electrical Machines II</td>
<td>(0,100)</td>
</tr>
<tr>
<td>ETC221T</td>
<td>Electronic Communication II</td>
<td>(0,100)</td>
</tr>
<tr>
<td>MDR101T</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0,100)*</td>
</tr>
<tr>
<td>MEQ211T</td>
<td>Medical Equipment II</td>
<td>(0,100)</td>
</tr>
<tr>
<td>MHC101T</td>
<td>Mechanics I</td>
<td>(0,100)</td>
</tr>
<tr>
<td>PCM221T</td>
<td>Process Instrumentation II</td>
<td>(0,100)</td>
</tr>
<tr>
<td>SMT211T</td>
<td>Strength of Materials II</td>
<td>(0,100)*</td>
</tr>
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</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Credits</th>
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</thead>
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<td>DPJ301T</td>
<td>Design Project III</td>
<td>(0,100)</td>
</tr>
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</table>

plus four of the following subjects (to orient to a specific field in Electrical Engineering, students should consult the subject selection guide at the end of this qualification). Subjects are offered at the location determined by the department:

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Credits</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>DSY341T</td>
<td>Digital Systems III</td>
<td>(0,100)</td>
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<tr>
<td>ELC331T</td>
<td>Electronics III</td>
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<td>ELD331T</td>
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<td>EMA341T</td>
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<td>MWC301T</td>
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<td>PCM321T</td>
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<tr>
<td>PWE311T</td>
<td>Power Electronics III</td>
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<tr>
<td>RAE311T</td>
<td>Radio Engineering III</td>
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<tr>
<td>SFD301T</td>
<td>Software Design III</td>
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</tr>
<tr>
<td>TLV311T</td>
<td>Television III</td>
<td>(0,100)</td>
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</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE SECOND YEAR: 1,000
THIRD YEAR

FIRST SEMESTER

EXP1EEH Experiential Learning I (0,500)
TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

EXP2EEH Experiential Learning II (0,500)
TOTAL CREDITS FOR THE SEMESTER: 0,500
TOTAL CREDITS FOR THE THIRD YEAR: 1,000

SUBJECT SELECTION GUIDE
To orient to a specific field in Electrical Engineering, the following is a guide to the optional subjects (timetable will give priority to subjects as set out in the subject selection guide):

• CLINICAL ENGINEERING
  Field description:
  A career in clinical engineering relates to the maintenance, implementation and management of electrical and electronic equipment used in hospitals for the medical care and treatment of patients. The career involves finding solutions to engineering problems and the implementation and maintenance of medical equipment, by applying sound scientific and technical knowledge and mathematical skills.

  FIRST SEMESTER
  Bio-Systems I, Digital Systems II, Electronics III and Medical Equipment II.

  SECOND SEMESTER
  Digital Systems III, Medical Equipment: Equipment III and Medical Equipment: Systems III.

• DIGITAL TECHNOLOGY
  Field Description:
  Digital technology is defined as the technology of processing and distributing data, audio and video signals with equipment and in subsystems. It forms the basis of modern computer technology, computer networks, all audio and video equipment and telecommunications technology. The training programme equips students with a sound scientific background and mathematical skills that enable them to solve engineering problems and implement and maintain systems at a technical level.

  FIRST SEMESTER
  Digital Systems II, Electronic Communication II and Electronics III.

  SECOND SEMESTER
  Control Systems III, Digital Systems III, Logic Design III and Software Design III.

• ELECTRONIC ENGINEERING
  Field description:
  Electronic engineering deals mainly with the implementation and maintenance of electronic systems, using the accumulation of signals at the analogue level from signals and sensors, the amplification of these and the presentation and processing of the data. Appropriate feedback systems may be implemented in order to enhance the performance of systems. The discipline finds application in the audio, video, electronic manufacturing and electronic control fields. The discipline involves sound scientific and mathematical skills at a technical level to solve engineering problems.

  FIRST SEMESTER
  Digital Systems II, Electronic Communication II and Electronics III.

  SECOND SEMESTER
  Control Systems III, Digital Systems III, Electronic Communication III and Software Design III.
• POWER ENGINEERING  
Field description:
Power engineering becomes more advanced in the generation and distribution of power through the use of sophisticated digital and electronically controlled devices. Students who have completed this qualification will be able to understand, evaluate, plan, install, repair and maintain electrical power equipment used in the field. Possible employers are manufacturers, Eskom, mines, municipalities and general industrial manufacturers.

FIRST SEMESTER  
Digital Systems II, Electrical Engineering III and Electrical Machines II.

SECOND SEMESTER  
Control Systems III, Electrical Distribution III, Electrical Machines III and Electrical Protection III.

• PROCESS INSTRUMENTATION  
Field description:
Process instrumentation becomes more sophisticated every day with the development of digital and electronic components and controlled devices. Students who have completed this qualification will be able to understand, evaluate, plan, install, repair and maintain the digital, electrical and electronic equipment used in industry. Possible employers are industrial manufacturers, Eskom, mines and general industrial workplaces.

FIRST SEMESTER  
Digital Systems II, Electronics III and Process Instrumentation II.

SECOND SEMESTER  
Control Systems III, Digital Systems III, Power Electronics III and Process Instrumentation III.

• TELECOMMUNICATION ENGINEERING  
Field Description:  
The student who has completed his or her studies will be skilled and competent in the marketing, developing and repair of electronic systems for the world market. Students will also be able to program, integrate and maintain systems. Possible employers are electronic system companies and general electronic application companies that operate in all fields.

FIRST SEMESTER  
Digital Systems II, Electronic Communication II and Digital Communication II.

SECOND SEMESTER  
Digital Systems III, Electronic Communication III, Electronics III and Radio Engineering III.

5.4 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: ELECTRICAL  
Qualification code: BTEE01

REMARKS  
a. Admission requirement(s):  
A National Diploma: Engineering: Electrical or an NQF level 6 diploma or bachelor’s degree in Electrical Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.
b. Selection criteria: Admission is subject to selection.

c. Minimum duration: One year.

d. Presentation and campus: eMalahleni Campus (evening classes offered over a period of two years). Pretoria Campus (one year of day classes or two years of block-based classes on Saturdays). Please note that the campuses indicated are subject to change and confirmation.

e. Intake for the qualification: January and July.

f. Readmission: See Chapter 3 of Students’ Rules and Regulations.

g. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

h. Additional costs: While it is the University’s policy to keep class fees and additional costs as low as possible, it should be stated that students will be expected to supply and purchase their own writing paper, pencils and pens, the required textbooks, multimeters, breadboards and calculators. Personal computers are highly recommended.

i. Recommendation: It is recommended that the student register for this qualification at the beginning of the academic year, work on his or her project proposal and theoretical background study, and only commence with the practical part of the qualification in the second semester (on completion of the four theoretical subjects in the first semester).


k. Subject credits: Subject credits are shown in brackets after each subject.

Key to asterisks:
* Information does not correspond to information in Report 151.
** MEQ40XT and MEQ40YT must be taken concurrently and will count as one subject.

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES

FIRST OR SECOND SEMESTER
The subjects below are offered in semesters, as determined by the Department.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGM411T</td>
<td>Engineering Management IV</td>
<td>(0,100)</td>
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<tr>
<td>EMT451T</td>
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<td>Design Project III</td>
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<tr>
<td>IPR412R</td>
<td>Industrial Project IV (re-registration)</td>
<td>(0,000)</td>
<td></td>
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</table>

plus one of the following subjects:

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSY401T</td>
<td>Control Systems IV</td>
<td>(0,100)</td>
<td>Control Systems III</td>
</tr>
<tr>
<td>SPR401T</td>
<td>Signal Processing IV</td>
<td>(0,100)</td>
<td>Mathematics III</td>
</tr>
</tbody>
</table>
plus four of the following subjects (to orient to a specific field in Electrical Engineering, students should consult the subject selection guide at the end of this qualification). Subjects are offered at the location determined by the Department:

- **CNW401T** Computer Networks IV (0,100)
- **CSY401T** Control Systems IV (if not already passed) (0,100)
- **CTM401T** Clinical Engineering Technology Management IV (0,100)
- **DCS401T** Digital Control Systems IV (0,100)
- **DSP401T** Digital Signal Processing IV (0,100)
- **ELC411T** Electronics IV (0,100)
- **EMA411T** Electrical Machines IV (0,100)
- **ENT401B** Entrepreneurship IV (0,100)*
- **EPC401T** Electrical Protection IV (0,100)
- **ETC401T** Electronic Communication IV (0,100)
- **HVE401T** High-Voltage Engineering IV (0,100)
- **MCS401T** Micro-Controller Systems IV (0,100)
- **MEQ401T** Medical Equipment IV (0,100)
- **MEQ40XT** Medical Equipment: Equipment IV** (0,100)
- **MEQ40YT** Medical Equipment: Systems IV** (0,100)
- **MSD401T** Microsystems Design IV (0,100)
- **MWE401T** Microwave Engineering IV (0,100)
- **NMS401T** Numerical Methods and Statistics IV (0,100)
- **NSY401T** Networks Systems IV (0,100)
- **OET401T** Opto-Electronics IV (0,100)
- **PCM401T** Process Instrumentation IV (0,100)
- **PWE411T** Power Electronics IV (0,100)
- **PWS401T** Power Systems IV (0,100)
- **RAE411T** Radio Engineering IV (0,100)
- **SCO401T** Satellite Communications IV (0,100)
- **SFE401T** Software Engineering IV (0,100)
- **SPR401T** Signal Processing IV (if not already passed) (0,100)
- **TVE401T** Television Engineering IV (0,100)

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

**SUBJECT SELECTION GUIDE**

To orient to a specific field in Electrical Engineering, the following is a guide to the optional subjects:

- **CLINICAL ENGINEERING**
  Clinical Engineering Technology Management IV, Electronics IV, Medical Equipment: Equipment IV, Medical Equipment: Systems IV and Signal Processing IV.

- **DIGITAL TECHNOLOGY**
  Control Systems IV or Signal Processing IV.

  plus four of the following subjects:

- **ELECTRONIC ENGINEERING**
  Electronics IV and Signal Processing IV.

  plus three of the following subjects:
• POWER ENGINEERING  
  Control Systems IV.

  plus four of the following subjects:  
  Electrical Machines IV, Entrepreneurship IV, Electrical Protection IV, High-Voltage Engineering IV,  
  Numerical Methods and Statistics IV, Power Electronics IV and Power Systems IV.

• PROCESS INSTRUMENTATION  
  Control Systems IV and Process Instrumentation IV.

  plus three of the following subjects:  
  Digital Control Systems IV, Digital Signal Processing IV, Electronics IV, Entrepreneurship IV,  
  Numerical Methods and Statistics IV, Network Systems IV, Opto-Electronics IV, Signal Processing IV  
  and Software Engineering IV.

• TELECOMMUNICATION TECHNOLOGY  
  Electronic Communication IV and Signal Processing IV.

  plus three of the following subjects:  
  Computer Networks IV, Control Systems IV, Digital Control Systems IV, Digital Signal Processing IV,  
  Electronics IV, Entrepreneurship IV, Micro-Controller Systems IV, Microsystems Design IV, Microwave  
  Engineering IV, Numerical Methods and Statistics IV, Network Systems IV, Opto-Electronics IV, Radio  
  Engineering IV, Satellite Communications IV, Signal Processing IV and Software Engineering IV.

5.5.1 NATIONAL DIPLOMA: ENGINEERING: MECHANICAL AND NATIONAL  
  DIPLOMA: ENGINEERING: ELECTRICAL  
  Qualification code: NDDM01

5.5.2 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: MECHANICAL  
  AND BACCALAUREUS TECHNOLOGIAE: ENGINEERING: ELECTRICAL  
  Qualification code: BTDM96

  NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2009.  
  STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL  
  2016 (FOR NDDM01) AND 2010 (FOR BTDM96) TO OBTAIN IT, SUBJECT TO THE  
  STIPULATIONS OF REGULATION 3.1.1 ON THE MAXIMUM DURATION OF STUDY.

  Phase-out dates:  31 December 2010/2016

  Please consult the Prospectus of the Department of Mechanical Engineering for information  
  relating to these qualifications.

5.6 MAGISTER TECHNOLOGIAE: ENGINEERING: ELECTRICAL  
  (Structured)  
  Qualification code: MTEES0

  REMARKS

  a. Admission requirement(s): A Baccalaureus Technologiae: Engineering: Electrical with an  
     aggregate of 60% for the final year of study with Engineering Mathematics IV and at least one of the  
     following subjects: Signal Processing IV, and/or Control Systems IV, or an NQF level 7  
     bachelor’s or honours degree in Electrical Engineering with an aggregate of 60% for the final year of study obtained from a  
     South African university.
Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Recommended subject(s): Software Engineering IV and at least two specialisation subjects.

c. Selection criteria: Admission is competitive and depends on available space. Prospective students may be required to pass an admission test.

d. Minimum duration: A minimum of one year and a maximum of three years.

e. Presentation and campus: Pretoria Campus (block-based classes). Please note that the campus indicated is subject to change and confirmation.

f. Subject groups (fields of specialisation): Students will be given a choice of one of the following subject groups:
   • Control and Image Processing
   • Power Engineering
   • Telecommunication Technology

g. Subject credits: Subject credits are shown in brackets after each subject.

h. Articulation to MSc qualifications: Articulation to the MSc programme offered in partnership with ESIEE (France) and Managed by F’SATIE at the Tshwane University of Technology may be done. Please contact the Head of the Department for further details.

Key to asterisks:
* Information does not correspond to information in Report 151.
(Deviations approved by the Senate in March 2009.)

SUBJECT GROUP 1: CONTROL AND IMAGE PROCESSING

FIRST OR SECOND SEMESTER

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<tbody>
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<td>CSY501T</td>
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<td>EAN501T</td>
<td>Engineering Analysis V</td>
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<td>MIi501T</td>
<td>Machine Intelligence V</td>
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<tr>
<td>RCS500T</td>
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<td>(0,500)</td>
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<tr>
<td>RCS500R</td>
<td>Research Report: Engineering: Electrical: Control Systems V (re-registration)</td>
<td>(0,000)</td>
</tr>
<tr>
<td>RMD501C</td>
<td>Research Methodology</td>
<td>(0,050)</td>
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<tr>
<td>SII501T</td>
<td>Scientific Computing V</td>
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plus one of the following subjects:

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<tbody>
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<td>IAS501T</td>
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<td>RTS501T</td>
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<tr>
<td>SEI501T</td>
<td>Special Topics I*</td>
<td>(0,100)</td>
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TOTAL CREDITS FOR SUBJECT GROUP 1: 1,000
### SUBJECT GROUP 2: POWER ENGINEERING

#### FIRST OR SECOND SEMESTER

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<td>Engineering Analysis V</td>
<td>(0,100)</td>
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<td>PWS501T</td>
<td>Power Systems V</td>
<td>(0,100)</td>
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<td>RMD501C</td>
<td>Research Methodology</td>
<td>(0,050)</td>
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<td>Electrical: Power Engineering V</td>
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<tr>
<td></td>
<td>(year subject)</td>
<td></td>
</tr>
<tr>
<td>RPM500R</td>
<td>Research Report: Engineering:</td>
<td>(0,000)</td>
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<tr>
<td></td>
<td>Electrical: Power Engineering V</td>
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<tr>
<td></td>
<td>(re-registration)</td>
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<tr>
<td>SII501T</td>
<td>Scientific Computing V</td>
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plus one of the following subjects:

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<tr>
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<th>SUBJECT</th>
<th>CREDIT</th>
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<tbody>
<tr>
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<tr>
<td>EEM501T</td>
<td>Electrical Machines and Drives V</td>
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<td>EGS501T</td>
<td>Energy Systems and Technology V</td>
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<td>Power Analysis V</td>
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TOTAL CREDITS FOR SUBJECT GROUP 2: 1,000

### SUBJECT GROUP 3: TELECOMMUNICATION TECHNOLOGY

#### FIRST OR SECOND SEMESTER

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<tbody>
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<td>EAN501T</td>
<td>Engineering Analysis V</td>
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<td>RET500T</td>
<td>Research Report: Engineering:</td>
<td>(0,500)</td>
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<tr>
<td></td>
<td>Electrical: Telecommunication</td>
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</tr>
<tr>
<td></td>
<td>Technology V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(year subject)</td>
<td></td>
</tr>
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<td>RET500R</td>
<td>Research Report: Engineering:</td>
<td>(0,000)</td>
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<tr>
<td></td>
<td>Electrical: Telecommunication</td>
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</tr>
<tr>
<td></td>
<td>Technology V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(re-registration)</td>
<td></td>
</tr>
<tr>
<td>RMD501C</td>
<td>Research Methodology</td>
<td>(0,050)</td>
</tr>
<tr>
<td>SII501T</td>
<td>Scientific Computing V</td>
<td>(0,050)</td>
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<td>TMM501T</td>
<td>Telecommunications V</td>
<td>(0,100)</td>
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</table>

plus one of the following subjects:

<table>
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<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDD501T</td>
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<tr>
<td>HFS501T</td>
<td>High-Frequency Systems V</td>
<td>(0,100)</td>
</tr>
<tr>
<td>RTS501T</td>
<td>Real-Time Systems V</td>
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</tr>
<tr>
<td>SEI501T</td>
<td>Special Topics I*</td>
<td>(0,100)</td>
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</table>

TOTAL CREDITS FOR SUBJECT GROUP 3: 1,000
5.7 MAGISTER TECHNOLOGIAE: ENGINEERING: ELECTRICAL
Qualification code: MTEE95

REMARKS

a. Admission requirement(s):
   A Baccalaureus Technologiae: Engineering: Electrical or an NQF level 7 bachelor’s or honours degree in Electrical Engineering obtained from a South African university.

   Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant's suitability for admission to the programme.

b. Selection criteria:
   All applications are subject to selection.

c. Duration:
   A minimum of one year and a maximum of three years.

d. Presentation and campus:
   Pretoria Campus (research).

   Please note that the campus indicated is subject to change and confirmation.

e. Dissertation:
   A student who applies for the Magister Technologiae: Engineering: Electrical has to submit a dissertation with a limited scope on an approved subject.

   Research will be done in the following niche areas in Electrical Engineering:
   • Clinical Engineering
   • Control Engineering
   • Electronics
   • Power Engineering
   • Telecommunication Engineering

f. Subject credits:
   Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
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<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEE500T</td>
<td>Dissertation: Engineering: Electrical</td>
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</tr>
<tr>
<td>DEE500R</td>
<td>Dissertation: Engineering: (re-registration)</td>
<td>(0,000)</td>
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   TOTAL CREDITS FOR THE QUALIFICATION: 1,000

5.8 DOCTOR TECHNOLOGIAE: ENGINEERING: ELECTRICAL
Qualification code: DTEE96

REMARKS

a. Admission requirement(s):
   A Magister Technologiae: Engineering: Electrical or an NQF level 8 master’s degree in Electrical Engineering obtained from a South African university.

   Holders of any other equivalent South African or foreign master’s degrees may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of
their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of two years and a maximum of five years.

d. Presentation and campus: Pretoria Campus (research). Please note that the campus indicated is subject to change and confirmation.

e. Thesis: The Doctorate in Technology: Engineering: Electrical will be conferred on the basis of a thesis on an approved topic.

Research will be done in the following niche areas in Electrical Engineering:
- Clinical Engineering
- Control Engineering
- Electronics
- Power Engineering
- Telecommunication Engineering

f. Subject credits: Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
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<th>SUBJECT</th>
<th>CREDIT</th>
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</thead>
<tbody>
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<td>Thesis: Engineering: Electrical</td>
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<td>DEE700R</td>
<td>Thesis: Engineering: Electrical (re-registration)</td>
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TOTAL CREDITS FOR THE QUALIFICATION: 2,000

5.9 MSc (ELECTRONIC ENGINEERING)
Qualification code: PGEE04

REMARKS

Please note: This qualification is offered in partnership with the ESIEE (France) and is managed by F’SATIE at the Tshwane University of Technology. The degree is conferred by the ESIEE (France). The rules of the ESIEE thus apply to this qualification. Students are required to accumulate 90 ECTS (European Credit Transfer System) credits. Thirty ECTS credits are awarded for a research Magister Technologiae: Engineering: Electrical, which the student has to complete before the MSc can be conferred.

a. Admission requirement(s): A Baccalaureus Technologiae: Engineering: Electrical with an aggregate of 60% for the final year of study with Engineering Mathematics IV and at least two of the following subjects: Signal Processing IV, Control Systems IV, Digital Control Systems IV and Digital Signal Processing IV, or an NQF level 7 bachelor’s or honours degree in Electrical Engineering with a aggregate of 60% for the final year of study obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.
b. Recommended subject(s): Software Engineering IV and at least two specialisation subjects.

c. Selection criteria: Admission is competitive and is dependent on available space. Prospective students may be requested to pass an admission test.

d. Minimum duration: Two years.

e. Presentation and campus: Pretoria Campus. Please note that the campus indicated is subject to change and confirmation.

f. Subject credits: Subject credits are shown in brackets after each subject.

ATTENDANCE

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<thead>
<tr>
<th>CODE</th>
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<tr>
<td>ESI5001</td>
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<td>ESI5002</td>
<td>Digital Electronics V</td>
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<td>ESI5003</td>
<td>Digital Control V</td>
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<td>ESI5009</td>
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<tr>
<td>ESI5026</td>
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5.10 MSc (POWER ENGINEERING)

Qualification code: PGPW07

REMARKS

Please note: This qualification is offered in partnership with the ESIEE (France) and is managed by F’SATIE at the Tshwane University of Technology. The degree is conferred by the ESIEE (France). The rules of the ESIEE thus apply to this qualification. Students are required to accumulate 90 ECTS (European Credit Transfer System) credits. Thirty ECTS credits are awarded for a research Magister Technologiae: Engineering: Electrical, which the student has to complete before the MSc can be conferred.

a. Admission requirement(s): A Baccalaureus Technologiae: Engineering: Electrical with an aggregate of 60% for the final year of study with Engineering Mathematics IV and at least two of the following subjects: Signal Processing IV, Control Systems IV, Digital Control Systems IV and Digital Signal Processing IV, or an NQF level 7 bachelor’s or honours degree in Electrical Engineering with an aggregate of 60% for the final year of study obtained from a South African university.
Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Recommended subject(s): Software Engineering IV and at least two specialisation subjects.

c. Selection criteria: Admission is competitive and depends on available space. Prospective students may be requested to pass an admission test.

d. Minimum duration: Two years.

e. Presentation and campus: Pretoria Campus. Please note that the campus indicated is subject to change and confirmation.

f. Subject credits: Subject credits are shown in brackets after each subject.

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<tr>
<td>ESI5027</td>
<td>Conversion Systems V</td>
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### 5.11 SUBJECT INFORMATION

Syllabus content subject to change to accommodate industry changes.

**SUBJECT NAME:** ADVANCED CONTROL SYSTEMS V  
**SUBJECT CODE:** ESI5010  
**EVALUATION METHOD:** CONTINUOUS ASSESSMENT  
**TOTAL TUITION TIME:** ± 90 hours  
**OVERVIEW OF SYLLABUS:**  
A selection of advanced control system topics, such as fuzzy control, optimal and multivariable control, robust and non-linear control.

**SUBJECT NAME:** ADVANCED EMBEDDED SYSTEMS V  
**SUBJECT CODE:** ESI5011  
**EVALUATION METHOD:** CONTINUOUS ASSESSMENT  
**TOTAL TUITION TIME:** ± 90 hours  
**OVERVIEW OF SYLLABUS:**  
A selection of advanced embedded system topics, such as multi and co-processor design, real-time and high-speed design.
SUBJECT NAME: BIO-SYSTEMS I
SUBJECT CODE: BIS101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
An engineering approach to the human body, with reference to medical terminology and the health care environment. Basic medical terminology. Organ systems: cell structure, movement structures, digestive system, ventilation, control and regulation. Special organ systems (the endocrine system), the thyroid gland.

SUBJECT NAME: CLINICAL ENGINEERING TECHNOLOGY MANAGEMENT IV
SUBJECT CODE: CTM401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Environment, research and development, the manufacturing process, acquisition, commissioning, support, replacement, communication skills, personnel structures, professional ethics.

SUBJECT NAME: COMMUNICATION SKILLS I
SUBJECT CODE: COS151T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Specific, discipline-related interpretation, presentation and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. The students will be introduced to aspects of scaffolded reading as a tool to acquire knowledge and interpretative abilities in their subject disciplines.

SUBJECT NAME: COMPUTER NETWORKS IV
SUBJECT CODE: CNW401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Introduction, electrical interfacing, local area networks (LAN), wide area networks (WAN), Internet.

SUBJECT NAME: COMPUTER SKILLS I
SUBJECT CODE: CSK101C
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Components of a microcomputer system and engineering applications of software. Managing personal computers. This subject covers hardware operating systems (Windows 2000 and MS-DOS), Microsoft Word, Microsoft PowerPoint, Excel, and an introduction to the Internet.

SUBJECT NAME: CONTROL SYSTEMS III
SUBJECT CODE: CSY321T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Mathematical modelling of systems, stability of linear feedback systems, steady state error, feedback-control characteristics, the root locus, compensation of feedback control and frequency response. Programmable Logic Controllers (PLCs).
SUBJECT NAME: CONTROL SYSTEMS IV
SUBJECT CODE: CSY401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: CONTROL SYSTEMS V
SUBJECT CODE: CSY501T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
System modelling, discrete-time analysis and digital controller design.

SUBJECT NAME: CONVERSION SYSTEMS V
SUBJECT CODE: CVS501T, ESI5027
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Converter theory, electromechanical systems, electric materials, EM field calculation, distribution (non-linear and transient problems, numerical methods, applications), transmission, planning and design.

SUBJECT NAME: DESIGN PROJECT III
SUBJECT CODE: DPJ301T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
This subject covers the concepts and implementation of the design of electronic systems. This includes the context of electronic design (the technology-based organisation), systems engineering concepts (from problem-solving to design implementation), practical implementation, including circuit design, construction and documentation. Assessment is through open-book tests, a practical project, a research topic and a final examination.

SUBJECT NAME: DIGITAL COMMUNICATION II
SUBJECT CODE: DCO201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Networks; OSI Model; Implementation; Protocols; Services.

SUBJECT NAME: DIGITAL COMMUNICATION V
SUBJECT CODE: DCO501T, ESI5001
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Fourier analysis and filtering, probability and stochastic processes, information theory and entropy, advanced modulation techniques, block and convolutional coding, performance analysis, networking fundamentals, system modelling.

SUBJECT NAME: DIGITAL CONTROL V
SUBJECT CODE: ESI5003
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
System modelling, discrete-time analysis and digital controller design.
SUBJECT NAME: DIGITAL CONTROL SYSTEMS IV
SUBJECT CODE: DCS401T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Discrete-time models and sampled data systems, difference equations, mathematical representation of the sampling process using the Z-transform, analysis of sampled data systems, stability considerations of sampled data systems, design of compensation for sampled data systems, using transform techniques.

SUBJECT NAME: DIGITAL ELECTRONICS V
SUBJECT CODE: ESI5002
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Analysis of advanced digital electronic circuits, best practice design and prototyping principles.

SUBJECT NAME: DIGITAL SIGNAL PROCESSING IV
SUBJECT CODE: DSP401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Introduction to digital signal processing. Sampling analogue signals that are to be converted into their discrete counterparts. The characteristics of discrete-time signals and systems. The three different domains that discrete-time signals are represented in. Time-domain representation and analysis of discrete-time signals and systems (using convolution and difference equations), frequency-domain (Discrete Fourier series, Discrete Fourier Transform, Fast Fourier Transform) representation and analysis and the z-Transform. Applications of digital signal processing; for example, digital filter design.

SUBJECT NAME: DIGITAL SYSTEMS I
SUBJECT CODE: DSY151T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 140 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to digital systems. Basic principles of digital systems in respect of basic digital components in the use of digital circuits such as logic gates. Basic system analysis and application.

SUBJECT NAME: DIGITAL SYSTEMS I
SUBJECT CODE: DSY131T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Basic components of digital circuits, namely NOT, AND and NOR gates. How more complex gates and logic functions can be built from the basic gates. Boolean algebra and Karnaugh maps are used to simplify functions. Combinational logic circuits, including adders, comparators, decoders, encoders, multiplexers, demultiplexers and error control circuits. Binary, octal, decimal and hexadecimal numbers and operations. Basic components of sequential circuits, namely latches and flip-flops. Counters.

SUBJECT NAME: DIGITAL SYSTEMS II
SUBJECT CODE: DSY231T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
How more complex memory components, such as counters and registers, can be built from the basic components. Different analogue-to-digital and digital-to-analogue converters. Introduction to microprocessor systems and programmable interface control devices (PiCs). TTL and CMOS-integrated circuit technologies and electronic display units. Introduction to programmable logic devices (PLD, EPLD, FPGA).
SUBJECT NAME: DIGITAL SYSTEMS III
SUBJECT CODE: DSY341T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
The emphasis is on computer memory and microcontrollers. Static and dynamic characteristics of read-write memories (SRAM, DRAM), structure and applications. Read-only memories (ROM, EPROM, FLASH). Microcontroller architecture. The design and implementation of applications with flow charts and assembler language form an important component of the subject.

SUBJECT NAME: ELECTRICAL DISTRIBUTION III
SUBJECT CODE: ELD331T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
The principles and operation of different types of power stations and substations. High-voltage transmission lines, switchgear, cables, isolators, line supports, feeders and busbars.

SUBJECT NAME: ELECTRICAL ENGINEERING I
SUBJECT CODE: EEN141T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 140 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to electrical engineering. Basic principles of electrical engineering in respect of measurements and different units. Application of basic components such as resistance, capacitance and inductance.

SUBJECT NAME: ELECTRICAL ENGINEERING II
SUBJECT CODE: EEN111T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
The correct use of SI units and their applications, the construction and maintenance of batteries, a network analysis of direct current circuits and AC theory, a study of various measuring instruments. An investigation into the effects of magnetic lines of force, the application and use of magnetic fields, inductance and the factors affecting it, capacitors and their operation.

SUBJECT NAME: ELECTRICAL ENGINEERING III
SUBJECT CODE: EEN211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
The analysis of networks by means of different methods, the effect of harmonics, three-phase systems, power factor correction, the operation of motors and transformers.

SUBJECT NAME: ELECTRICAL ENGINEERING III
SUBJECT CODE: EEN311T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
ELECTRICAL ENGINEERING

SUBJECT NAME: ELECTRICAL MACHINES AND DRIVES V
SUBJECT CODE: EEM501T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Electrical machines modelling and analysis, dynamic and transient analysis of electrical machines, design of electrical machines, vector control of asynchronous machines, electronically commutated machines, special electrical machines (switch reluctance motors, permanent magnet machines, electrical actuators, etc.).

SUBJECT NAME: ELECTRICAL MACHINES II
SUBJECT CODE: EMA241T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Various electrical motors and generators are used on a large scale in the industry. Introduction to electrical machines and the principles on which such machines operate. Single-phase transformers, induction machines and direct current machines.

SUBJECT NAME: ELECTRICAL MACHINES III
SUBJECT CODE: EMA341T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Generation of electricity and the application of electrical machines in traction, the mining industry and other industries form the basis of this subject. Synchronous generators and motors, three-phase transformers and induction motors.

SUBJECT NAME: ELECTRICAL MACHINES IV
SUBJECT CODE: EMA411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
A deeper study of the design and maintenance of synchronous, induction and special machines, as well as the different control techniques and uses of those machines.

SUBJECT NAME: ELECTRICAL PROTECTION III
SUBJECT CODE: EPC321T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ELECTRICAL PROTECTION IV
SUBJECT CODE: EPC401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
A great deal of theoretical knowledge and calculations, as well as tasks and practicals on inrush currents, protections on different types of transformer feeders, motors, generators and feeders, busbar (busbar zone protection) distance and cable differential protection.
SUBJECT NAME: ELECTRONIC COMMUNICATION II
SUBJECT CODE: ETC221T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ELECTRONIC COMMUNICATION III
SUBJECT CODE: ETC301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ELECTRONIC COMMUNICATION IV
SUBJECT CODE: ETC401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Spectral analysis of common electronic signals: time/frequency representation of signals, Fourier series and Fourier transform application, factors affecting bandwidth occupied by signal. Principles of analogue-to-digital transmission in communications: source coding, PCM, DPCM, delta modulation, bandwidth requirement of PCM, digital signalling format, multi-level signalling. Channel effect on symbol transmission and inter-symbol interference (ISI) control: ISI, eye diagram as a tool, raised cosine filtering, partial response signalling. Bandpass digital modulation: Generation and detection of ASK, FSK, CPFSK, PSK, BPSK, QPSK, MSK, and QAM, multi-level digital bandpass modulation, calculation of probability of error, bandwidth efficiency, applications. Channel coding and coding for reliable transmission over the channel: Linear block codes and cyclic codes, convolutional code. This subject is designed to equip student with the ability to design some components of communication systems that meet some specifications of overall performance, respecting some system constraints which are related to power, channel bandwidth, effect of noise and complexity of the system. ETC401T will give you the foundation needed for digital communication courses taught in higher academic degrees.

SUBJECT NAME: ELECTRONICS I
SUBJECT CODE: ELC131T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 140 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to electronics. Basic principles of electronics in respect of measurements and different units. Application of basic components such as resistance, capacitance and inductance. Atomic theory, Bohr model and basic transistor theory and application.

SUBJECT NAME: ELECTRONICS I
SUBJECT CODE: ELC111T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Introduction to electronic components. The use of measuring instruments, semiconductor theory, the P-N junction, diodes and rectification, simple power supplies, the bipolar junction transistor, the field effect transistor and operational amplifiers. On completion of this subject, the student should be able to do circuit analysis and design in respect of simple power supplies without smoothing, the direct-current operation of single-stage transistor amplifiers, and simple operational amplifier functions. Theoretical presentation supported by practical experiments in a laboratory, which are taken into account during assessment.
SUBJECT NAME: ELECTRONICS II
SUBJECT CODE: ELC211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours

OVERVIEW OF SYLLABUS:
Modelling of electronic components and their application in circuit analysis. The focus is on the basic concepts and operation of unregulated supplies, voltage regulation, the small-signal modelling of single- and multi-stage bipolar and field effect transistor amplifiers, including amplifier configurations, specific operational amplifier applications, heat-sink design and an introduction to opto-electronics. On the completion of this subject, the student should be able to design and construct simple linear-regulated power supplies, predict the operation and characteristics of single- and multi-stage amplifiers through mathematical analysis and analyse and design specific operational amplifier applications. The theoretical presentation is supported by practical laboratory work. Assessment is through closed-book tests, a practical project, a research topic and a final examination.

SUBJECT NAME: ELECTRONICS III
SUBJECT CODE: ELC331T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours

OVERVIEW OF SYLLABUS:
Analysis and design of analogue electronic subsystems. More advanced concepts and practical implementation of feedback configurations, time and frequency principles of amplifier systems, design and analysis of oscillator circuits, design and analysis of active filters, electromagnetic compatibility and noise in electronic systems, operation and application of various analogue functions like voltage-controlled oscillators, phase-locked loops, isolation amplifiers and others. On completion of this subject, the student should be able to demonstrate the principles of analogue circuit design and analysis. The theoretical presentation is supported by a practical design project. Assessment is through open-book tests, a practical project, a research topic and a final examination.

SUBJECT NAME: ELECTRONICS IV
SUBJECT CODE: ELC411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours

OVERVIEW OF SYLLABUS:
Design and integration of complete electronic systems: all subject knowledge of the preceding electronics subjects is incorporated into complete system designs. Emphasis is placed on the process from the idea to the product by means of projects with students working in groups. Students have to design and present solutions to problems, build and demonstrate projects. The following topics are covered: problem-solving, design assessment, design implementation, project budgeting, procurement, practical construction and documentation, oral presentation and practical demonstration. Projects incorporate analogue, digital, as well as computer interfacing principles. Assessment is through open-book and closed-book tests, a practical project, a research topic and a final examination.

SUBJECT NAME: EMBEDDED SYSTEMS V
SUBJECT CODE: EDD501T, ESI5004
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours

OVERVIEW OF SYLLABUS:
VHDL and FPGA design and real-time DSP implementation.

SUBJECT NAME: ENERGY SYSTEMS AND TECHNOLOGY V
SUBJECT CODE: EGS501T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours

OVERVIEW OF SYLLABUS:
Modelling of alternative energy sources and corresponding technological options.

SUBJECT NAME: ENGINEERING ANALYSIS V
SUBJECT CODE: EAN501T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours

OVERVIEW OF SYLLABUS:
Signal spaces, mappings, deterministic signal theory, stochastic signal theory.
SUBJECT NAME: ENGINEERING MANAGEMENT IV
SUBJECT CODE: EGM411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
The engineer and the manager, the engineering organisation. Total quality management: principles, applications, the human element in engineering management, engineering and construction contracts, professional ethics, the business plan, strategic and financial management.

SUBJECT NAME: ENGINEERING MATHEMATICS IV
SUBJECT CODE: EMT451T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ENGINEERING SCIENCE I
SUBJECT CODE: ESL111T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ENTREPRENEURSHIP IV
SUBJECT CODE: ENT401B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: EXPERIENTIAL LEARNING I
SUBJECT CODE: EXP1EEH
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
Industry-related training, as determined by the industry and the University.

SUBJECT NAME: EXPERIENTIAL LEARNING II
SUBJECT CODE: EXP2EEH
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
Industry-related training, as determined by the industry and the University.

SUBJECT NAME: FOUNDATION ACADEMIC SKILLS
SUBJECT CODE: FPACA01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
• The important aspects of life skills: Campus ethics, learning styles and whole-brain thinking, self-image and assertive behaviour, time management, self-motivation, conflict management, sexuality and relationships, problem-solving skills, managing stress, multicultural society, techniques for summarising and memorising, how to cope with assessments and assignments, creativity, and many more. The life-skills sessions are participative, with group discussions and personal application to optimise the student’s learning experience.
• The important aspects of English communication: Interpret, relate and reflect on all available and relevant resource material in proper English. Communicate orally in a comprehensible and clear manner in both general and subject-specific communication. Demonstrate intermediate-level proficiency in written English.

• An element of Computer Literacy is woven throughout the presentation of this subject as well as the Mathematics course. Students will be introduced to the basic functions of personal computing, Windows, word processors and other software, and engage in e-learning as a way of becoming familiar with this kind of technology.

SUBJECT NAME: FOUNDATION APPLIED SCIENCE
SUBJECT CODE: FAPP01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours

OVERVIEW OF SYLLABUS:
An introduction to physics, statics, dynamics and electricity, dealing with the following topics: Atom theory, electricity, magnetism and electromagnetism, inductors, capacitors, RLC networks. Basic concepts of atomic bonds, crystal structures and material properties. Control over properties by heat treatment, microstructure and phase diagrams. Measuring material properties with mechanical tests like tensile tests, hardness tests, impact tests, etc. General forming processes, plastic strain, strain hardening, hot working, cold working, recrystallisation. Properties and uses of the well-known non-ferrous alloys. The basic properties and behaviour of ceramics, polymers and compound materials. Measurements, mechanics, motion in one-dimension kinematics, laws of motion dynamics, kinetic theory of matter and properties of matter, introduction to the biological sciences, general laws of movement, mechanics, heat, hydrodynamics, electricity and magnetism, wave motion, and nuclear physics.

SUBJECT NAME: FOUNDATION COMMUNICATION SKILLS I
SUBJECT CODE: FPCOS02
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours

OVERVIEW OF SYLLABUS:
Speaking and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. Communication theory, non-verbal communication (body language). Oral presentations, interviews, developing leadership and participation skills. Technical reports and correspondence.

SUBJECT NAME: FOUNDATION COMPUTER SKILLS I
SUBJECT CODE: FPCSK02
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 140 hours

OVERVIEW OF SYLLABUS:
Operating systems (Windows environment); Basic word-processing skills (MS-Word); Spreadsheets (MS-Excel); Presentations tools (PowerPoint); Communications, connectivity, the internet and the Web; and Components of a microcomputer system and engineering applications of software. Managing personal computers. This subject covers hardware operating systems (Windows 2000 and MS-DOS), Microsoft Word, Microsoft PowerPoint, Excel, and an introduction to the Internet.

SUBJECT NAME: FOUNDATION ENGINEERING
SUBJECT CODE: FPEGI01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours

OVERVIEW OF SYLLABUS:
An introduction to technical drawing as well as the type of skills, workplace environments and knowledge required in all the major fields of engineering that are practised in the South African economy.
SUBJECT NAME: FOUNDATION ELECTRICAL ENGINEERING I
SUBJECT CODE: FPEEN01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 140 hours
OVERVIEW OF SYLLABUS:
Module 1: Introduction to engineering, factory safety, measurements, engineering materials, projects. Module 2: Lettering, line work and freehand sketches, geometric constructions, fasteners, dimensioning, methods of projections, sectioning, interpenetration curves and pipe developments, conversions: imperial to metric, terms and abbreviations used in engineering drawing, piping diagrams. The correct use of SI units and their applications, the construction and maintenance of batteries, a network analysis of direct current circuits and AC theory, a study of various measuring instruments. An investigation into the effects of magnetic lines of force, the application and use of magnetic fields, inductance and the factors affecting it, capacitors and their operation.

SUBJECT NAME: FOUNDATION ELECTRONICS I
SUBJECT CODE: FPELC01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 140 hours
OVERVIEW OF SYLLABUS:
Module 1: Atom theory, electricity, magnetism and electromagnetism, inductors, capacitors, RLC networks. Module 2: Atoms, molecules and ions, chemical formulas and equations, the periodic table, chemical bonding, nomenclature of inorganic compounds, phases of matter, solutions, the rate of chemical reactions, equilibrium in chemical reactions, acids and bases, oxidation, reduction and electrochemical cells. Introduction to electronic components. The use of measuring instruments, semiconductor theory, the P-N junction, diodes and rectification, simple power supplies, the bipolar junction transistor, the field effect transistor and operational amplifiers. On completion of this subject, the student should be able to do circuit analysis and design in respect of simple power supplies without smoothing, the direct-current operation of single-stage transistor amplifiers, and simple operational amplifier functions. Theoretical presentation supported by practical experiments in a laboratory, which are taken into account during assessment.

SUBJECT NAME: FOUNDATION ENGINEERING SCIENCE I
SUBJECT CODE: FPESL01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 140 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION MATHEMATICS
SUBJECT CODE: FPMAT05
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
Basic algebra, functions, exponents and logarithm, differential calculus, trigonometry, geometry. Basic mathematics. Differentiation. Integration. Matrices and determinants. Vectors. Data handling. Complex numbers or mensuration. Students will be introduced to personal computers, Windows and e-learning technologies as a fundamental part of this subject.

SUBJECT NAME: FOUNDATION MATHEMATICS I
SUBJECT CODE: FPMAT04
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 140 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: FRENCH LANGUAGE SKILLS  
SUBJECT CODE: ES15007  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 80 hours  
OVERVIEW OF SYLLABUS: Conversational French for beginners.

SUBJECT NAME: HIGH-FREQUENCY SYSTEMS V  
SUBJECT CODE: ES15005, HFS501T  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 90 hours  
OVERVIEW OF SYLLABUS: HF system fundamentals and analysis, measurement principles and propagation models.

SUBJECT NAME: HIGH-VOLTAGE ENGINEERING IV  
SUBJECT CODE: HVE401T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 68 hours  

SUBJECT NAME: IMAGE ANALYSIS V  
SUBJECT CODE: ES15012  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 90 hours  
OVERVIEW OF SYLLABUS: Image formation, frequency domain analysis, neighbourhood processing, texture, segmentation, shape, feature extraction, transformation and classification.

SUBJECT NAME: IMAGE ANALYSIS SYSTEMS V  
SUBJECT CODE: IAS501T  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: Not available  
OVERVIEW OF SYLLABUS: Not available.

SUBJECT NAME: INDUSTRIAL PROJECT IV  
SUBJECT CODE: IPR410T  
EVALUATION METHOD: PROJECT  
TOTAL TUITION TIME: 12 months  
OVERVIEW OF SYLLABUS: The industrial project is continued throughout the study period for at least 300 hours. The subject content is handled on a personal basis and is evaluated by a panel of experts. The work may be done in the University environment or in the industry itself. Assessment of the project is based on a written report and its oral presentation before a panel of experts.

SUBJECT NAME: LOGIC DESIGN III  
SUBJECT CODE: LOD311T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 70 hours  
OVERVIEW OF SYLLABUS: Designing programmable logic matrixes (PLD, EPLD, FPGA, PAL, GAL). The next step is the intelligent controllers and mechanical control. The architecture, building up and installation of PCs. Support software.
SUBJECT NAME: MACHINE INTELLIGENCE V  
SUBJECT CODE: ES15013, MI1501T  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 90 hours  
OVERVIEW OF SYLLABUS: Supervised learning (Bayesian classification, linear classifiers, non-linear classifiers, including neural networks and support vector machines), unsupervised learning and special topics, such as genetic algorithms and swarms and ants optimisation.

SUBJECT NAME: MANAGEMENT V  
SUBJECT CODE: ES15006  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 90 hours  
OVERVIEW OF SYLLABUS: Project management, marketing, business strategies, financial planning, new product development and engineering research methodology.

SUBJECT NAME: MATHEMATICS I  
SUBJECT CODE: MAT171T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 70 hours  

SUBJECT NAME: MATHEMATICS II  
SUBJECT CODE: MAT181T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 180 hours  
OVERVIEW OF SYLLABUS: A detailed and comprehensive introduction to the theorems and applications of the differential calculus, trigonometry, algebra and matrices. Elementary data handling and vector calculations are also introduced with practical introductions to the applications specific to the engineering discipline in which the student is registered.

SUBJECT NAME: MATHEMATICS III  
SUBJECT CODE: MAT271T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 70 hours  
SUBJECT NAME: MECHANICAL ENGINEERING DRAWING I
SUBJECT CODE: MDR101T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
(Subject taken from Engineering: Mechanical.)

SUBJECT NAME: MECHANICS I
SUBJECT CODE: MHC101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MEDICAL EQUIPMENT II
SUBJECT CODE: MEQ211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Introduction to medical equipment and medical systems.

SUBJECT NAME: MEDICAL EQUIPMENT: EQUIPMENT III
SUBJECT CODE: MEQ33XT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Introduction to transducers, detectors and sensors, diagnostic equipment and systems: thermometers, blood pressure measurement, electrocardiography, electro-encephalography, electromyography, lung function and spirometry, cardiac output monitoring, specialised systems, therapeutic equipment and systems: infusion pumps, dialysis machines, ventilation.

SUBJECT NAME: MEDICAL EQUIPMENT: EQUIPMENT IV
SUBJECT CODE: MEQ40XT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Health delivery systems, overview of health policies and systems for treating patients, clinical engineering support systems, environmental hazards: health hazards, sterilisation, quarantine, EMC, gases. Advanced therapeutic equipment: anaesthesia, ventilators, energy transfer instruments, thrombo-elastography. Rehabilitation devices: cardiovascular prosthesis and assist devices, therapy equipment, therapy-supportive equipment, physiological prostheses.

SUBJECT NAME: MEDICAL EQUIPMENT: SYSTEMS III
SUBJECT CODE: MEQ33YT
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Electrical safety of medical equipment and systems, testing for performance of systems and fault-finding. Non-ionising radiation: production and detection, introduction to clinical engineering management.
SUBJECT NAME: MEDICAL EQUIPMENT: SYSTEMS IV  
SUBJECT CODE: MEQ40YT  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 70 hours

OVERVIEW OF SYLLABUS:
Advanced transducers and sensors, advanced measurement and analysis techniques, modern imaging systems.

SUBJECT NAME: MICRO-CONTROLER SYSTEMS IV  
SUBJECT CODE: MCS401T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 70 hours

OVERVIEW OF SYLLABUS:
Microcontrollers can be seen in action all around us. Although not noticeable, the microcontrollers function in environments not suitable for personal computers. Students learn the advantages and shortcomings of microcontrollers. The practical applications with which the students are confronted stress the importance of microcontroller use.

SUBJECT NAME: MICROSYSTEMS DESIGN IV  
SUBJECT CODE: MSD401T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 70 hours

OVERVIEW OF SYLLABUS:
The world of the microprocessor and microcomputer is discovered in this subject, taking the i486 as an example. It is covered in fair detail, from register level to the general software design. The i386-EX with its integrated peripherals on the same chip is investigated as a complete microcomputer.

SUBJECT NAME: MICROWAVE COMMUNICATION III  
SUBJECT CODE: MWC301T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 70 hours

OVERVIEW OF SYLLABUS:
Microwave propagation and antennae. Passive and active microwave components. Microwave systems – analogue, digital, satellite. Optical fibre communication, propagation, sources and detectors, systems. Measurements, RF power, system performance tests.

SUBJECT NAME: MICROWAVE ENGINEERING IV  
SUBJECT CODE: MWE401T  
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)  
TOTAL TUITION TIME: ± 70 hours

OVERVIEW OF SYLLABUS:
Introduction to electromagnetic field theory. Microstrip design and matching at RF. Space diversity engineering. Innovations in system design and implementation. Surveying and radio network planning. Assessment of digital radio performance, propagation, outage time and prediction, interference.

SUBJECT NAME: NETWORK SYSTEMS IV  
SUBJECT CODE: NSY401T  
EVALUATION METHOD: PRACTICAL  
TOTAL TUITION TIME: ± 20 hours

OVERVIEW OF SYLLABUS:
A study of wireless networks, including spread-spectrum analyses, roaming and hand-over. (Subject taken from Engineering: Computer Systems.)

SUBJECT NAME: NUMERICAL METHODS AND STATISTICS IV  
SUBJECT CODE: NMS401T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 70 hours

OVERVIEW OF SYLLABUS:
Mathematical basics, non-linear equations, ordinary differential equations, interpolation, numerical integration, sampling, descriptive statistics, regression analysis, probability.

ELECTRICAL ENGINEERING
SUBJECT NAME: OPTO-ELECTRONICS IV
SUBJECT CODE: OET401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: POWER ANALYSIS V
SUBJECT CODE: PWN501T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Power flow analysis, stability analysis of power systems, control of power systems.

SUBJECT NAME: POWER ELECTRONICS III
SUBJECT CODE: PWE311T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Application of thyristors to deal with the following: controlled rectifiers, AC voltage controllers, DC choppers and controlled inverters. Principles of switching and component design.

SUBJECT NAME: POWER ELECTRONICS IV
SUBJECT CODE: PWE411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Theory: in-depth study of semi-conductor devices, resonant converters, power supplies, AC and DC drive control principles, control and feedback model design.

SUBJECT NAME: POWER SYSTEMS IV
SUBJECT CODE: PWS401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: POWER SYSTEMS V
SUBJECT CODE: PWS501T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Generation theory, transmission and distribution theory, interconnection of power systems.

SUBJECT NAME: PROCESS INSTRUMENTATION I
SUBJECT CODE: PCM101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Introduction to process instrumentation and standard process definitions, as applied in the industry. Elements and variables of process principles in terms of pressure, flow, volume, level, thermometry, density, light and optics.
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<tr>
<th>SUBJECT NAME</th>
<th>PROCESS INSTRUMENTATION II</th>
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<tr>
<td>SUBJECT CODE</td>
<td>PCM221T</td>
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<td>EVALUATION METHOD</td>
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OVERVIEW OF SYLLABUS:
Design procedures and calculations for flow, level, temperature and pressure measurements. Electronic detectors, transmitters, actuators and their applications. Introduction to basic control theory, controllers and programmable logic controllers (PLCs). Laboratory assignments, including distributed control systems and programming of PLCs.

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<th>SUBJECT NAME</th>
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<tr>
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OVERVIEW OF SYLLABUS:
Control and operation of plant units for boilers, heat exchangers, furnaces and distillation columns. Control strategies for feedback, feed forward, cascade, adaptive, ratio, selective, time cycle and time schedule control. Instrumentation for hazardous environments. Computer applications and telemetering as used in process instrumentation.

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OVERVIEW OF SYLLABUS:
Measurement and control of chemical composition, pollution measurement and control, application of engineering principles, automatic control applications and instrumentation project management. The illustration of SCADA (Supervisory Control and Data Acquisition) to be used in industry to acquire relevant plant information.

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OVERVIEW OF SYLLABUS:

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<td>RAE311T</td>
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OVERVIEW OF SYLLABUS:
SUBJECT NAME: REAL-TIME SIGNAL PROCESSING V
SUBJECT CODE: ESI5014
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Advanced signal processing concepts (adaptive filtering, multirate processing and wavelets, filter banks etc.) with the emphasis on real-time DSP implementation.

SUBJECT NAME: REAL-TIME SYSTEMS V
SUBJECT CODE: RTS501T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Advanced signal processing concepts (adaptive filtering, multirate processing and wavelets, filter banks, etc.) with the emphasis on real-time DSP implementation.

SUBJECT NAME: RESEARCH METHODOLOGY
SUBJECT CODE: RMD501C
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 45 hours
OVERVIEW OF SYLLABUS:
Research methods and approaches, information-gathering approaches, writing research reports.

SUBJECT NAME: RF DESIGN V
SUBJECT CODE: ESI5009
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
RF component design principles and analysis.

SUBJECT NAME: SATELLITE COMMUNICATIONS IV
SUBJECT CODE: SCO401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: SCIENTIFIC COMPUTING V
SUBJECT CODE: ESI5026, SII501T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Scientific computing fundamentals, simulation, C++, Matlab, Simulink and Scilab.

SUBJECT NAME: SIGNAL PROCESSING IV
SUBJECT CODE: SPR401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Introduction to signal processing. Analogue signal processing. Signals and systems, and the characteristics of signals and systems. The different domains that continuous-time signals are represented in. Time-domain representation and analysis of continuous-time signals and systems (using convolution and ordinary differential equations), frequency-domain representation and analysis (Fourier series, Fourier Transform) and the Laplace Transform. Applications of signal processing; for example, the design of continuous-time filters.
SUBJECT NAME: SIGNAL THEORY V
SUBJECT CODE: ESI5021
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Signal spaces, mappings, deterministic signal theory and stochastic signal theory.

SUBJECT NAME: SOFTWARE DESIGN II
SUBJECT CODE: SFD201T
EVALUATION METHOD: PRACTICAL
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Developing and applying structured programming. Programming concepts covered in Programming I in greater detail. These include data management (static, dynamic), functions, I/O files, structures. Additional topics, such as port communications and embedded programming, may be covered. The subject is very practical, and assessment is based on a number of programming tasks completed during the semester.

SUBJECT NAME: SOFTWARE DESIGN III
SUBJECT CODE: SFD301T
EVALUATION METHOD: PRACTICAL
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
The basic principles of object-orientated programming. The basic principles of object-orientated programming, such as creation of abstract data types (ADTs), inheritance, polymorphism, operator overloading and templates. The basics of graphics, which is used to illustrate many of the object-orientated principles. Windows programming may also be covered. The subject is practically orientated, and students are evaluated on a number of programming tasks completed during the semester.

SUBJECT NAME: SOFTWARE ENGINEERING IV
SUBJECT CODE: SFE401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
An introduction to software engineering. The principles involved in the design phases of the development cycle of a complete software project from conceptual development to product delivery. Concepts, such as definitions of the software product and process, project planning, risk analysis, tracking, analysis, design, object-orientated analysis and quality control. On completion of the subject, students have to submit a software product developed in a group context.

SUBJECT NAME: SOFTWARE ENGINEERING V
SUBJECT CODE: ESI5022
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Software engineering fundamentals, UML design principles and operating system basics.

SUBJECT NAME: SPECIAL TOPICS I
SUBJECT CODE: ESI5023, SEI501T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Special topics based on a selection of seminal research papers from a chosen field.

SUBJECT NAME: SPECIAL TOPICS II
SUBJECT CODE: ESI5024
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Special topics based on a selection of seminal research papers from a chosen field.
SUBJECT NAME: SPECIAL TOPICS III
SUBJECT CODE: ESI5025
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Special topics based on a selection of seminal research papers from a chosen field.

SUBJECT NAME: STRENGTH OF MATERIALS II
SUBJECT CODE: SMT211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Analysis of simple structures. Simple stress and strain. Shearing forces and bending moments. Thin cylinders (stationary and rotating). Torsion of circular shafts. Helical springs. Laboratory work. (Subject taken from Engineering: Mechanical.)

SUBJECT NAME: TELECOMMUNICATIONS V
SUBJECT CODE: TMM501T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Fixed networks, mobile networks, RF and optical networks.

SUBJECT NAME: TELECOMMUNICATION NETWORKS V
SUBJECT CODE: ESI5008
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Fixed networks, mobile networks, RF and optical networks.

SUBJECT NAME: TELEVISION III
SUBJECT CODE: TLV311T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: TELEVISION ENGINEERING IV
SUBJECT CODE: TVE401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Colour television principles and colour television systems. Encoding, decoding, receiver theory, video processing, studio layout, advanced television systems, digital video, laser recording technology, as well as measuring technology and measuring techniques for video. Equipment with the appropriate test patterns.
6. DEPARTMENT OF GEOMATICS

6.1 NATIONAL DIPLOMA: CARTOGRAPHY
Qualification code: NDKA03

REMARKS

a. Admission requirement(s): For students who obtained a Senior Certificate before 2008: A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics. For students who have obtained a National Senior Certificate since 2008: A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

b. Recommended subject(s): None.

c. Selection criteria: Admission Point Score (APS) and assessment procedures:

Candidates with an APS score of 24+ will be accepted on condition that the marks they obtained in the final school examination (Grade 12 examination) are the same as or higher than the marks used for the conditional selection process. Applicants with an APS score from 20 to 23 will be required to undergo additional assessment (potential assessment) to gain access to a National Diploma.

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

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<tr>
<th>APS</th>
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Total APS score: 24 (six subjects)

FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
<tr>
<td>TOTAL APS SCORE (six subjects, excluding Life Orientation)</td>
<td>24</td>
</tr>
</tbody>
</table>
d. Minimum duration: Three years.
e. Presentation and campus: Pretoria Campus (day classes).
   Please note that the campus indicated is subject to change and confirmation.
f. Intake for the qualification: January only.
g. Readmission: See Chapter 3 of Students’ Rules and Regulations.
h. Accreditation by professional body: This qualification has been accredited by the South African Council of Professional and Technical Surveyors (PLATO).
i. Experiential Learning I and II: See Chapter 5 of Students’ Rules and Regulations.
j. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks
* Information does not correspond to information in Report 151.
(Deviations approved by the Senate in August 2005.)

- SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES.
- SUBJECTS ARE OFFERED IN SEMESTERS AS DETERMINED BY THE HEAD OF THE DEPARTMENT.

FIRST YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COS101T</td>
<td>Communication Skills I</td>
<td>(0,050)*</td>
<td></td>
</tr>
<tr>
<td>CSK101G</td>
<td>Computer Skills I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>DRW101B</td>
<td>Drawing I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>GEG111T</td>
<td>Geography I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>STA111T</td>
<td>Statistics I</td>
<td>(0,084)*</td>
<td></td>
</tr>
<tr>
<td>SUR111T</td>
<td>Surveying I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUR11YT</td>
<td>Surveying: Theory I</td>
<td>(0,066)</td>
<td></td>
</tr>
<tr>
<td>SUR11ZT</td>
<td>Surveying: Practical I</td>
<td>(0,034)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
<td>(0,084)*</td>
<td></td>
</tr>
<tr>
<td>MNC101T</td>
<td>Management: Civil I</td>
<td>(0,050)*</td>
<td></td>
</tr>
<tr>
<td>MPJ201T</td>
<td>Map Projections II</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>PHO211T</td>
<td>Photogrammetry II</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>SUD211T</td>
<td>Survey Drawing II</td>
<td>(0,083)</td>
<td>Drawing I</td>
</tr>
<tr>
<td>SUR211T</td>
<td>Surveying II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUR21XT</td>
<td>Surveying: Control II</td>
<td>(0,043)</td>
<td>Surveying I</td>
</tr>
<tr>
<td>SUR21YT</td>
<td>Surveying: Engineering II</td>
<td>(0,022)</td>
<td>Surveying I</td>
</tr>
<tr>
<td>SUR21ZT</td>
<td>Surveying: Practical II</td>
<td>(0,035)</td>
<td>Surveying I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE FIRST YEAR: 1,000
### SECOND YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP1CAR</td>
<td>Experiential Learning I</td>
<td>(0.500)</td>
</tr>
<tr>
<td></td>
<td>Surveying I</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.500

#### SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP2CAR</td>
<td>Experiential Learning II</td>
<td>(0.500)</td>
</tr>
<tr>
<td></td>
<td>Experiential Learning I</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.500

**TOTAL CREDITS FOR THE SECOND YEAR:** 1.000

### THIRD YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGH301T</td>
<td>Cartography III</td>
<td>(0.125)</td>
</tr>
<tr>
<td>COA301T</td>
<td>Computer Applications III</td>
<td>(0.100)</td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0.100)</td>
</tr>
<tr>
<td>PHU161E</td>
<td>Physics ID</td>
<td>(0.083)</td>
</tr>
<tr>
<td>SMI301T</td>
<td>Stereo Mapping III</td>
<td>(0.100)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.508

#### SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJE301T</td>
<td>Adjustment of Errors III</td>
<td>(0.083)*</td>
</tr>
<tr>
<td>CGQ301T</td>
<td>Cartographic Techniques III</td>
<td></td>
</tr>
<tr>
<td>CGQ30XT</td>
<td>Cartographic Techniques: Theory III</td>
<td>(0.063)</td>
</tr>
<tr>
<td>CGQ30YT</td>
<td>Cartographic Techniques: Practical III</td>
<td>(0.062)</td>
</tr>
<tr>
<td>CSU301T</td>
<td>Cadastral Surveying III</td>
<td>(0.100)</td>
</tr>
<tr>
<td>GIS301T</td>
<td>Geographic Information Systems III*</td>
<td>(0.084)</td>
</tr>
<tr>
<td>PHO331T</td>
<td>Photogrammetry III</td>
<td>(0.100)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.492

**TOTAL CREDITS FOR THE THIRD YEAR:** 1.000

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### 6.2 NATIONAL DIPLOMA: SURVEYING

**Qualification code:** NDSU03

**REMARKS**

- **a. Admission requirement(s):** For students who obtained a Senior Certificate before 2008: A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics. For students who have obtained a National Senior Certificate since 2008: A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

- **b. Recommended subject(s):** None.
c. Selection criteria: Admission Point Score (APS) and assessment procedures:

Candidates with an APS score of 24+ will be accepted on condition that the marks they obtained in the final school examination (Grade 12 examination) are the same as or higher than the marks used for the conditional selection process. Applicants with an APS score from 20 to 23 will be required to undergo additional assessment (potential assessment) to gain access to a National Diploma.

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)

FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
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<td></td>
</tr>
<tr>
<td>TOTAL APS SCORE (six subjects, excluding Life Orientation)</td>
<td>24</td>
</tr>
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</table>

d. Minimum duration: Three years.
e. Presentation and campus: Pretoria Campus (day classes).

Please note that the campus indicated is subject to change and confirmation.
f. Intake for the qualification: January only.
g. Readmission: See Chapter 3 of Students’ Rules and Regulations.
h. Registration with professional body: This qualification has been accredited by the South African Council of Professional and Technical Surveyors (PLATO).

It is compulsory for students who register for the National Diploma: Surveying to register as technicians-in-training with the South African Council of Professional and Technical Surveyors (PLATO). A National Diploma: Surveying is required for registration as a surveyor. Contact the Head of the Department in that regard. Students are also strongly advised to register with the South African Geomatics Institute (SAGI).
Experiential Learning I and II: See Chapter 5 of Students’ Rules and Regulations.

Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks

* Information does not correspond to information in Report 151.
  (Deviations approved by the Senate in August 2005.)

** The subject, Control Surveying: Theory III (CDS30YT), must be taken simultaneously with Control Surveying: Project III (CDS30XT), or Control Surveying: Theory III (CDS30YT) must already have been completed when Control Surveying: Project III (CDS30XT) is taken.

• SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES.
• SUBJECTS ARE OFFERED IN SEMESTERS AS DETERMINED BY THE HEAD OF THE DEPARTMENT.

FIRST YEAR

FIRST SEMESTER

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<td>Computer Skills I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>DRW101B</td>
<td>Drawing I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>GEG111T</td>
<td>Geography I</td>
<td>(0,083)</td>
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<td>Surveying: Theory I</td>
<td>(0,066)</td>
<td></td>
</tr>
<tr>
<td>SUR11ZT</td>
<td>Surveying: Practical I</td>
<td>(0,034)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

<table>
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<tr>
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<tbody>
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<td>(0,084)*</td>
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<td></td>
</tr>
<tr>
<td>MPJ201T</td>
<td>Map Projections II</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>PHO211T</td>
<td>Photogrammetry II</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>SUD211T</td>
<td>Survey Drawing II</td>
<td>(0,083)</td>
<td>Drawing I</td>
</tr>
<tr>
<td>SUR211T</td>
<td>Surveying II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUR21XT</td>
<td>Surveying: Control II</td>
<td>(0,043)</td>
<td>Surveying I</td>
</tr>
<tr>
<td>SUR21YT</td>
<td>Surveying: Engineering II</td>
<td>(0,022)</td>
<td>Surveying I</td>
</tr>
<tr>
<td>SUR21ZT</td>
<td>Surveying: Practical II</td>
<td>(0,035)</td>
<td>Surveying I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE FIRST YEAR: 1,000

SECOND YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP1SUR</td>
<td>Experiential Learning I</td>
<td>(0,500)</td>
<td>Surveying I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP2SUR</td>
<td>Experiential Learning II</td>
<td>(0,500)</td>
<td>Experiential Learning I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE SECOND YEAR: 1,000
THIRD YEAR

FIRST SEMESTER

CDS301T Control Surveying III
CDS30YT Control Surveying: Theory III** (0,062) Surveying II
CGH301T Cartography III (0,073)*
COA301T Computer Applications III (0,100) Computer Skills I
Surveying II
MAT271T Mathematics II (0,083)* Mathematics I
PHU161E Physics ID (0,083)
SMI301T Stereo Mapping III (0,073)* Photogrammetry II

TOTAL CREDITS FOR THE SEMESTER: 0,474

SECOND SEMESTER

AJE301T Adjustment of Errors III (0,083)* Mathematics II
CDS301T Control Surveying III
CDS30XT Control Surveying: Project III** (0,063) Surveying II
(offered in both semesters)
CSU301T Cadastral Surveying III (0,100) Survey Drawing II
GIS301T Geographic Information Systems III* (0,083)
PHO331T Photogrammetry III (0,072)* Photogrammetry II
SUR331T Surveying III
SUR33XT Surveying: Precise III (0,040) Surveying II
SUR33YT Surveying: Geometric III (0,045) Surveying II
SUR33ZT Surveying: Geometric Project III (0,040) Surveying II

TOTAL CREDITS FOR THE SEMESTER: 0,526

TOTAL CREDITS FOR THE THIRD YEAR: 1,000

6.3 BACCALAUREUS TECHNOLOGIAE: SURVEYING
Qualification code: BTSU02

REMARKS

a. Admission requirement(s): A National Diploma: Surveying or an NQF level 6 diploma or bachelor’s degree in Engineering Surveying obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Candidates who meet the minimum academic requirements might be invited for a personal interview with a panel consisting of the Head of the Department and at least two other senior academic staff members.
Students may be selected for the programme if all the following criteria can be met:

- Suitable student who complies with all admission requirements (both academic and those mentioned above).
- If an appropriate project is available for the student to work on.
- Where appropriate, the necessary equipment and facilities are available or will be obtainable in order to execute the entire project.
- The necessary funding is or will be available to fund the running expenses and other expenses related to the project.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes offered over a period of two years). Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.

f. Readmission: See Chapter 3 of Students’ Rules and Regulations.

g. Registration with professional body: This qualification has been accredited by the South African Council of Professional and Technical Surveyors (PLATO).

As from September 2004, persons in possession of the Baccalaureus Technologiae: Surveying and the required practical experience may register with the This qualification has been accredited by the South African Council of Professional and Technical Surveyors (PLATO).

h. Subject credits: Subject credits are shown in brackets after each subject.

Key to asterisks
* Information does not correspond to information in Report 151. (Deviations approved by the Senate in August 2005.)

Students must take the five compulsory subjects plus three additional subjects, which they should select from the remainder of the subjects.

**FIRST SEMESTER (2010)**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>GDE401T</td>
<td>Geometric Design IV</td>
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<tr>
<td>SUR411T</td>
<td>Surveying IV (Compulsory)</td>
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</table>

**SECOND SEMESTER (2010)**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>PMN411T</td>
<td>Practice Management IV (Compulsory)</td>
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<tr>
<td>RMD101L</td>
<td>Research Methodology</td>
<td>(0,097)*</td>
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<tr>
<td>TPN401T</td>
<td>Town Planning IV</td>
<td>(0,097)*</td>
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**FIRST SEMESTER (2011)**

<table>
<thead>
<tr>
<th>CODE</th>
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<th>CREDIT</th>
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</thead>
<tbody>
<tr>
<td>FMN141T</td>
<td>Financial Management</td>
<td>(0,097)*</td>
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<tr>
<td>GIS401T</td>
<td>Geographic Information Systems IV (Compulsory)</td>
<td>(0,125)</td>
</tr>
</tbody>
</table>
SECOND SEMESTER (2011)
GED401T Geodesy IV (Compulsory) (0,167)
PUY401T Project Management: Surveying IV (Compulsory) (0,125)
TOTAL CREDITS FOR THE QUALIFICATION 1,000

6.4 SUBJECT INFORMATION

Syllabus content subject to change to accommodate industry changes.

**ADJUSTMENT OF ERRORS III**
SUBJECT NAME: ADJUSTMENT OF ERRORS III
SUBJECT CODE: AJE301T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:

**CADASTRAL SURVEYING III**
SUBJECT NAME: CADASTRAL SURVEYING III
SUBJECT CODE: CSU301T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
Introduction to property law. Application of act directly pertaining to surveying and act affecting surveying indirectly.
(Subject taken from Surveying for Cartography.)

**CARTOGRAPHIC TECHNIQUES: PRACTICAL III**
SUBJECT NAME: CARTOGRAPHIC TECHNIQUES: PRACTICAL III
SUBJECT CODE: CGQ30YT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 96 hours
OVERVIEW OF SYLLABUS:
A cartographic project that reflects cartographic knowledge. Compilation of project in the form of an atlas.

**CARTOGRAPHIC TECHNIQUES: THEORY III**
SUBJECT NAME: CARTOGRAPHIC TECHNIQUES: THEORY III
SUBJECT CODE: CGQ30XT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:

**CARTOGRAPHY III**
SUBJECT NAME: CARTOGRAPHY III
SUBJECT CODE: CGH301T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
(Subject taken from Cartography for Surveying.)
SUBJECT NAME: COMMUNICATION SKILLS I  
SUBJECT CODE: COS101T  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 64 hours  
OVERVIEW OF SYLLABUS: Communication theory, non-verbal communication (body language). Oral presentations, interviews, Technical reports and correspondence.

SUBJECT NAME: COMPUTER APPLICATIONS III  
SUBJECT CODE: COA301T  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 96 hours  
OVERVIEW OF SYLLABUS: Program writing and program development in a high-level language (e.g. Turbo Basic, Turbo Pascal), subroutines, functions, files. Applications: use of software for project assignments. Database management systems: dBase IV, manipulation of data.

SUBJECT NAME: COMPUTER SKILLS I  
SUBJECT CODE: CSK101G  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 64 hours  
OVERVIEW OF SYLLABUS: Components of a microcomputer system. Engineering applications of software. Managing personal computers.

SUBJECT NAME: CONTROL SURVEYING: PROJECT III  
SUBJECT CODE: CDS30XT  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 96 hours  

SUBJECT NAME: CONTROL SURVEYING: THEORY III  
SUBJECT CODE: CDS30YT  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 80 hours  

SUBJECT NAME: DRAWING I  
SUBJECT CODE: DRW101B  
EVALUATION METHOD: CONTINUOUS ASSESSMENT  
TOTAL TUITION TIME: ± 96 hours  
OVERVIEW OF SYLLABUS: Drawing office practice, projections (orthographic and isometric), topographical drawings, specifications.

SUBJECT NAME: EXPERIENTIAL LEARNING I  
SUBJECT CODE: EXP1CAR, EXP1SUR  
EVALUATION METHOD: EXPERIENTIAL LEARNING  
TOTAL TUITION TIME: 6 months  
OVERVIEW OF SYLLABUS: To meet the requirements of the National Diploma, students must complete at least one year of applicable experiential learning, which will be evaluated by the Department.
SUBJECT NAME: EXPERIENTIAL LEARNING II
SUBJECT CODE: EXP2CAR, EXP2SUR
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
To meet the requirements of the National Diploma, students must complete at least one year of applicable experiential learning, which will be evaluated by the Department.

SUBJECT NAME: FINANCIAL MANAGEMENT
SUBJECT CODE: FMN141T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 30 hours
OVERVIEW OF SYLLABUS:
Costing, budgeting, cash flow, current value, inflation and building up of hire rates.

SUBJECT NAME: GEODESY IV
SUBJECT CODE: GED401T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 30 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: GEOGRAPHIC INFORMATION SYSTEMS III
SUBJECT CODE: GIS301T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 30 hours
OVERVIEW OF SYLLABUS:
Fundamentals of GIS. Spatial concepts. Spatial data. GIS hardware and software. Data input. Data analysis. GIS output. Practical applications of GIS.

SUBJECT NAME: GEOGRAPHIC INFORMATION SYSTEMS IV
SUBJECT CODE: GIS401T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 30 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: GEOGRAPHY I
SUBJECT CODE: GEG111T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: GEOMETRIC DESIGN IV
SUBJECT CODE: GDE401T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 30 hours
OVERVIEW OF SYLLABUS:
Principles and practice of road alignment. Intersection and interchange design.

SUBJECT NAME: MANAGEMENT: CIVIL I
SUBJECT CODE: MNC101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
Types of contracts, tenders, management principles, productivity. Office and site administration. (Subject taken from Engineering: Civil.)
SUBJECT NAME: MAP PROJECTIONS II
SUBJECT CODE: MPJ201T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MATHEMATICS I
SUBJECT CODE: MAT171T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 96 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MATHEMATICS II
SUBJECT CODE: MAT271T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 96 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: PHOTOGRAMMETRY II
SUBJECT CODE: PHO211T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
Applications, geometry of vertical photos, stereocopy, parallax, optics, cameras. Mapping - the approximate solution, elementary flight planning.

SUBJECT NAME: PHOTOGRAMMETRY III
SUBJECT CODE: PHO331T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
Rectification of aerial photos, terrestrial photogrammetry, photo control for aerial triangulation. Photogrammetric flight planning project.

SUBJECT NAME: PHYSICS ID
SUBJECT CODE: PHU161E
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
Light, reflection, lenses, prisms and dispersion, aberration, combined lenses, optical instruments, interference, deflection. Phase differences modulation. Laser: simple theory, types and applications.

SUBJECT NAME: PRACTICE MANAGEMENT IV
SUBJECT CODE: PMN411T
EVALUATION METHOD: 1 X 4-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 30 hours
OVERVIEW OF SYLLABUS:
The behavioural science approach to organisation. Motives and motivation. Some theories and studies of human behaviour, with specific reference to behaviour. Principles and practice of management.

SUBJECT NAME: PROJECT MANAGEMENT: SURVEYING IV
SUBJECT CODE: PUY401T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 30 hours
OVERVIEW OF SYLLABUS:
A number of industry-orientated tasks based on a sound investigation, a comprehensive report on the analysis and solution or completion of the task must be submitted. The tender process.
SUBJECT NAME: RESEARCH METHODOLOGY
SUBJECT CODE: RMD101L
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 30 hours
OVERVIEW OF SYLLABUS:
Research planning and design. The research report, hypothesis testing, report formats.

SUBJECT NAME: STATISTICS I
SUBJECT CODE: STA111T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 96 hours
OVERVIEW OF SYLLABUS:
Descriptive and inferential statistics, standard deviations, regression, correlation, z- and t-tests, modus, medians, variance frequency, histogram.

SUBJECT NAME: STEREO MAPPING III
SUBJECT CODE: SMI301T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
Mapping – the precise solution, orientations, photo control, aerial triangulation methods.

SUBJECT NAME: SURVEY DRAWING II
SUBJECT CODE: SUD211T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
Compilation and plotting of grids and graticule, topographic plans, plotting, scales, symbols. The production of longitudinal cross sections and mass haul diagrams.

SUBJECT NAME: SURVEYING IV
SUBJECT CODE: SUR411T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 30 hours
OVERVIEW OF SYLLABUS:
Instrumentation for precise surveying, application of spherical trigonometry to theodolite errors, effects and corrections of theodolite and level errors. Error analysis of EDM measurements, EDM calibration. Observation and calculation methods of precise surveying, detection and monitoring of movements, absolute and relative, application of least squares to analysis and design survey networks.

SUBJECT NAME: SURVEYING: CONTROL II
SUBJECT CODE: SUR21XT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
South African map series, cadastral information, triangulation, solving the triangle with sine drawing and solving the error figures, resection.

SUBJECT NAME: SURVEYING: ENGINEERING II
SUBJECT CODE: SUR21YT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 45 hours
OVERVIEW OF SYLLABUS:
EDM and lasers. Levelling, setting out profiles and batters, horizontal curve calculations and setting out procedures.

SUBJECT NAME: SURVEYING: GEOMETRIC III
SUBJECT CODE: SUR33YT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: SURVEYING: GEOMETRIC PROJECT III
SUBJECT CODE: SUR33ZT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 32 hours
OVERVIEW OF SYLLABUS:
Project: setting out simple and transition curves. Setting out vertical curves. Photo control.

SUBJECT NAME: SURVEYING: PRACTICAL I
SUBJECT CODE: SUR11ZT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 72 hours
OVERVIEW OF SYLLABUS:
Setting up and levelling of the level and theodolite. Taking levelling readings and compiling the field book, tests of and adjustments to the different levelling instruments. Longitudinal sections, cross sections, traverse, topographic surveying. Drawing a plan and interpolation of the contours.

SUBJECT NAME: SURVEYING: PRACTICAL II
SUBJECT CODE: SUR21ZT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 40 hours
OVERVIEW OF SYLLABUS:
Staking out roads that include a simple curve. Levelling of the longitudinal and cross sections. Setting out of profile and batters of intersection and resection.

SUBJECT NAME: SURVEYING: PRECISE III
SUBJECT CODE: SUR33XT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 48 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: SURVEYING: THEORY I
SUBJECT CODE: SUR11YT
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
Basic surveying principles, surveying, testing and adjustment of instrument errors, traverse, levelling of longitudinal and cross sections. Areas and volumes for excavations and filling. South African coordinate system. Calculation of joins and polars and corrections to tape measurements.

SUBJECT NAME: TOWN PLANNING IV
SUBJECT CODE: TPN401T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 30 hours
OVERVIEW OF SYLLABUS:
Historical perspective, modern trends. Land use: major land uses, land-use relationships, zoning. Township design: urban, local, residential layouts, informal settlements. Planning law and procedure, ordinances, etc.
7. DEPARTMENT OF INDUSTRIAL ENGINEERING

GENERIC STIPULATIONS WITH REGARD TO THE QUALIFICATIONS ISSUED:

The Purpose of the National Diploma: Engineering: Industrial includes the following:
This qualification is intended for employment at technician level. Persons with this qualification will be competent in applying techniques related to industrial engineering that are aimed at the improvement of organisational effectiveness and efficiency in both the manufacturing and service industries.

GENERIC OUTCOMES OF THE NATIONAL DIPLOMA: ENGINEERING: INDUSTRIAL

Exit-level outcome 1: Problem solving
Apply engineering principles to systematically diagnose and solve well-defined engineering problems.

Exit-level outcome 2: Application of scientific and engineering knowledge
Demonstrate the application of mathematical, science and engineering knowledge in an engineering environment.

Exit-level outcome 3: Engineering design
Perform procedural design of well-defined components, systems, works, products or processes to meet desired needs in accordance with applicable standards, codes of practice and legislation.

Exit-level outcome 4: Communication
Communicate technical, supervisory and general management information effectively, both orally and in writing, using appropriate language and terminology, structure, style and graphic support.

Exit-level outcome 5: Engineering management
Apply engineering management principles and concepts to engineering activities.

Exit-level outcome 6: Application of complementary knowledge
Demonstrate critical awareness of the impact of engineering activities on the social, industrial and physical environment, and of the need to act professionally within own limits of competence.

The purpose of the Baccalaureus Technologiae: Engineering: Industrial includes the following:
This qualification is intended for employment at technologist level. Persons with this qualification will be competent to make meaningful contributions to programmes focusing on productivity improvement, integrated manufacturing systems, operating information systems, and project and logistics management.

GENERIC OUTCOMES OF THE BACCALAUREUS TECHNOLOGIAE: ENGINEERING: INDUSTRIAL

Exit-level outcome 1: Problem solving
Apply engineering principles to systematically diagnose and solve well-defined engineering problems.

Exit-level outcome 2: Application of scientific and engineering knowledge
Demonstrate the application of mathematical, science and engineering knowledge in an engineering environment.

Exit-level outcome 3: Engineering design
Perform procedural design of well-defined components, systems, works, products or processes to meet desired needs in accordance with applicable standards, codes of practice and legislation.

Exit-level outcome 4: Communication
Communicate technical, supervisory and general management information effectively, both orally and in writing, using appropriate language and terminology, structure, style and graphical support.

Exit-level outcome 5: Engineering management
Apply engineering management principles and concepts to engineering activities.

Exit-level outcome 6: Project development
Identify, analyse, conduct and manage a project.

Exit-level outcome 7: Application of complementary knowledge
Demonstrate a critical awareness of the impact of engineering activities on the social, industrial and physical environment, and of the need to act professionally within own limits of competence.
REMARKS

a. Admission requirement(s) and selection criteria:

• FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:
  Admission requirement(s): A Senior Certificate or an equivalent qualification, with F symbols at Higher Grade or E symbols at Standard Grade for English, Mathematics and Physical Science.
  Recommended subject(s): None.
  Selection criteria: Prospective students who meet the above requirements, will sit for an admission test. Admission to either the formal qualification or a preparation programme is determined by a combination of the results of the admission test and the Senior Certificate marks. The offer to a prospective student of a place expires six months after the date on which the admission test is written.

• FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:
  See qualification NDEI03.

b. Minimum duration: Four years.

c. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

d. Intake for the qualification: January and July.

e. Readmission: See Chapter 3 of Students’ Rules and Regulations.

f. Experiential Learning I and II: See Chapter 5 of Students’ Rules and Regulations.

g. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

FIRST YEAR

FIRST SEMESTER

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<thead>
<tr>
<th>CODE</th>
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<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
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TOTAL CREDITS FOR THE SEMESTER: 0,250

SECOND SEMESTER

After completing all of the above subjects.

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<tr>
<td>MDR101B</td>
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<td>MHC121T</td>
<td>Mechanics I</td>
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<td><strong>TOTAL CREDITS FOR THE SEMESTER:</strong></td>
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<td><strong>TOTAL CREDITS FOR THE SECOND YEAR:</strong></td>
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<td>CSG201T</td>
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<td><strong>TOTAL CREDITS FOR THE THIRD YEAR:</strong></td>
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</table>
FOURTH YEAR

FIRST SEMESTER

EXP1EN   Experiential Learning I (0,375)

TOTAL CREDITS FOR THE SEMESTER: 0,375

SECOND SEMESTER

EXP2EN   Experiential Learning II (0,375) Experiential Learning I

TOTAL CREDITS FOR THE SEMESTER: 0,375

TOTAL CREDITS FOR THE FOURTH YEAR: 0,750

7.2 NATIONAL DIPLOMA: ENGINEERING: INDUSTRIAL (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION) (Pending final approval – Senate)
Qualification code: NDEIF0

NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2009. STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL 2014 TO OBTAIN IT, SUBJECT TO THE STIPULATIONS OF REGULATION 3.1.1 ON THE MAXIMUM DURATION OF STUDY.

Phase-out date: 31 December 2014

Presentation and Campus:
Pretoria Campus (day classes).
Please note that the campus indicated is subject to change and confirmation.

Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

FIRST YEAR

<table>
<thead>
<tr>
<th>CODE</th>
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TOTAL CREDITS FOR THE FIRST YEAR: 0,506
# SECOND YEAR

## FIRST SEMESTER

<table>
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<td>EWK121T</td>
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<td>MAT271T</td>
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<td>PEI111T</td>
<td>Production Engineering: Industrial I</td>
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**TOTAL CREDITS FOR THE SEMESTER:** 0.498

## SECOND SEMESTER

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<td>EWK221T</td>
<td>Engineering Work Study II</td>
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<td>FLM201T</td>
<td>Facility Layout and Materials Handling II</td>
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<td>MAT351T</td>
<td>Mathematics III</td>
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<td>PEI211T</td>
<td>Production Engineering: Industrial II</td>
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<td>QAS201T</td>
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**TOTAL CREDITS FOR THE SEMESTER:** 0.498

**TOTAL CREDITS FOR THE SECOND YEAR:** 0.996

## THIRD YEAR

*After completion of all the subjects in the first year.*

## FIRST SEMESTER

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<th>Course Title</th>
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<td>IAC321T</td>
<td>Industrial Accounting III</td>
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<td>ILE301T</td>
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<td>MED201B</td>
<td>Mechanical Engineering Design II</td>
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<td>ORS321T</td>
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**TOTAL CREDITS FOR THE SEMESTER:** 0.498

## SECOND SEMESTER

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**TOTAL CREDITS FOR THE SEMESTER:** 0.500

**TOTAL CREDITS FOR THE THIRD YEAR:** 0.998

## FOURTH YEAR

## FIRST SEMESTER

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<td>EXP2IEN</td>
<td>Experiential Learning II</td>
<td>0.500</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.500

**TOTAL CREDITS FOR THE FOURTH YEAR:** 0.500
REMARKS

a. Admission requirement(s): For students who obtained a Senior Certificate before 2008: A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics and an E symbol at the Higher Grade or a D symbol at the Standard Grade for Physical Science. For students who have obtained a National Senior Certificate since 2008: A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

b. Recommended subject(s): None.

c. Selection criteria: Admission Point Score (APS) and assessment procedures: Candidates with an APS score of 24+ will be admitted to the National Diploma or the National Diploma (Extended Curriculum). A candidate’s performance in an academic placement test written in January as part of the Faculty’s orientation programme will determine whether he or she will be channelled to the National Diploma or National Diploma (Extended Curriculum).

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)

FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
<tr>
<td>TOTAL APS SCORE (six subjects, excluding Life Orientation)</td>
<td>24</td>
</tr>
</tbody>
</table>

d. Minimum duration: Three years.

e. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.
f. Intake for the qualification: January and July.

g. Readmission: See Chapter 3 of Students’ Rules and Regulations.

h. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

i. Experiential Learning I and II: See Chapter 5 of Students’ Rules and Regulations.

j. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks:
* Information does not correspond to information in Report 151.
   (Deviations approved by the Senate in August 2005 and May 2008.)

**FIRST YEAR**

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI101T</td>
<td>Computer-Aided Draughting I*</td>
<td>(0,047)*</td>
<td></td>
</tr>
<tr>
<td>EGN101T</td>
<td>Engineering Communication I*</td>
<td>(0,042)</td>
<td></td>
</tr>
<tr>
<td>ETT101T</td>
<td>Electrotechnology I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>MDR101B</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>MHC101T</td>
<td>Mechanics I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>MME101T</td>
<td>Mechanical Manufacturing Engineering I</td>
<td>(0,083)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,504

**SECOND SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWK121T</td>
<td>Engineering Work Study I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0,083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MFR201T</td>
<td>Manufacturing Relations II</td>
<td>(0,083)</td>
<td>Engineering Communication I</td>
</tr>
<tr>
<td>MME201T</td>
<td>Mechanical Manufacturing Engineering II</td>
<td>(0,083)</td>
<td>Computer-Aided Draughting I</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mechanical Engineering Drawing I</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mechanical Manufacturing Engineering I</td>
</tr>
<tr>
<td>PEI111T</td>
<td>Production Engineering: Industrial I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>QTQ101T</td>
<td>Qualitative Techniques I</td>
<td>(0,083)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,498

TOTAL CREDITS FOR THE FIRST YEAR: 1,002

**SECOND YEAR**

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSG201T</td>
<td>Costing II</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>EWK221T</td>
<td>Engineering Work Study II</td>
<td>(0,083)</td>
<td>Engineering Work Study I</td>
</tr>
<tr>
<td>FLM201T</td>
<td>Facility Layout and Material Handling II</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>MAT351T</td>
<td>Mathematics III</td>
<td>(0,083)</td>
<td>Mathematics II</td>
</tr>
<tr>
<td>PEI211T</td>
<td>Production Engineering: Industrial II</td>
<td>(0,083)</td>
<td>Production Engineering: Industrial I</td>
</tr>
<tr>
<td>QAS201T</td>
<td>Quality Assurance II</td>
<td>(0,083)</td>
<td>Qualitative Techniques I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,498
### SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATM301B</td>
<td>Automation III</td>
<td>(0.085)*</td>
</tr>
<tr>
<td>EWK321T</td>
<td>Engineering Work Study III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>IAC321T</td>
<td>Industrial Accounting III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>ILE301T</td>
<td>Industrial Leadership III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MED201B</td>
<td>Mechanical Engineering Design II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>ORS321T</td>
<td>Operational Research III</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

Total Credits for the Semester: 0.500

### THIRD YEAR

### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP1IEN</td>
<td>Experiential Learning I</td>
<td>(0.500)</td>
</tr>
</tbody>
</table>

Total Credits for the Semester: 0.500

### SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP2IEN</td>
<td>Experiential Learning II</td>
<td>(0.500)</td>
</tr>
</tbody>
</table>

Total Credits for the Semester: 0.500

Total Credits for the Third Year: 1.000

### 7.4 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: INDUSTRIAL

Qualification code: BTEI03

**REMARKS**

a. Admission requirement(s): A National Diploma: Engineering: Industrial or an NQF level 6 diploma or bachelor’s degree in Industrial Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Students will be admitted through the evaluation of a portfolio of evidence, as well as an interview with the Head of the Department and/or an admission panel.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes). Please note that the campus indicated is subject to change and confirmation.
e. Intake for the qualification: January and July.

f. Readmission: See Chapter 3 of Students’ Rules and Regulations.

g. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

h. Subject credits: Subject credits are shown in brackets after each subject.

### FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENT401B</td>
<td>Entrepreneurship IV</td>
<td>(0,125)</td>
</tr>
<tr>
<td>ISY401T</td>
<td>Information Systems IV</td>
<td>(0,125)</td>
</tr>
<tr>
<td>PJR401T</td>
<td>Project Research IV</td>
<td>(0,125)</td>
</tr>
<tr>
<td>SDN411T</td>
<td>Systems Dynamics IV</td>
<td>(0,125)</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CREDITS FOR THE SEMESTER:</strong></td>
<td><strong>0,500</strong></td>
</tr>
</tbody>
</table>

### SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEN401T</td>
<td>Logistics Engineering IV</td>
<td>(0,125)</td>
</tr>
<tr>
<td>PHY401T</td>
<td>Production Technology IV</td>
<td>(0,125)</td>
</tr>
<tr>
<td>PJE401T</td>
<td>Project Engineering IV</td>
<td>(0,125)</td>
</tr>
<tr>
<td>QAS401T</td>
<td>Quality Assurance IV</td>
<td>(0,125)</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CREDITS FOR THE SEMESTER:</strong></td>
<td><strong>0,500</strong></td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CREDITS FOR THE QUALIFICATION:</strong></td>
<td><strong>1,000</strong></td>
</tr>
</tbody>
</table>

### 7.5 MAGISTER TECHNOLOGIAE: ENGINEERING: INDUSTRIAL Qualification code: MTEI95

#### REMARKS

a. Admission requirement(s): A Baccalaureus Technologiae: Engineering: Industrial or an NOF level 7 bachelor’s or honours degree in Industrial Engineering obtained from a South African university. Mathematics II and Research Methodology are prerequisites. Holders of any other equivalent South African or foreign qualifications may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of one year and a maximum of three years.

d. Presentation and campus: Pretoria Campus (research). Please note that the campus indicated is subject to change and confirmation.
In the dissertation, the student must prove that he or she understands a particular problem in the industry in which he or she has done research, is able to analyse and set it out logically, arrive at logical conclusions or a diagnosis, and is then able to make proposals for the solution or the elimination of the problem. The dissertation must comply with the usual general technical requirements and rules regarding scope, quality and layout. The chosen research theme must be based on one or more prerequisite Level IV subjects.

Subject credits: Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>INU530T</td>
<td>Dissertation: Engineering: Industrial</td>
<td>(1,000)</td>
</tr>
<tr>
<td>INU530R</td>
<td>Dissertation: Engineering: Industrial (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

**REMARKS**

a. **Admission requirement(s):** A Magister Technologiae: Engineering: Industrial or an NQF level 8 master’s degree in Industrial Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign master’s degree may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. **Selection criteria:** All applications are subject to selection.

c. **Duration:** A minimum of two years and a maximum of five years.

d. **Presentation and campus:** Pretoria Campus (research).

Please note that the campus indicated is subject to change and confirmation.

e. **Thesis:** An advanced research project with a thesis. In the thesis, the student must give proof of original and creative thinking and problem-solving. He or she must also be able to make a real contribution to the solving of a particular problem in the industry to which his or her research applies. The thesis must comply with the usual technical requirements and rules regarding scope, quality and layout.

f. **Subject credits:** Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>INU700T</td>
<td>Thesis: Engineering: Industrial</td>
<td>(2,000)</td>
</tr>
<tr>
<td>INU700R</td>
<td>Thesis: Engineering: Industrial (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 2,000
7.7 BACCALAUREUS TECHNOLOGIAE: TECHNOLOGY MANAGEMENT
Qualification code: BTTE01

REMARKS
a. Admission requirement(s): A National Diploma: Engineering or an equivalent qualification.
b. Selection criteria: Admission is subject to evaluation by a panel.
c. Minimum duration: One year.
d. Presentation and campus: Pretoria Campus (block-based classes).
   Please note that the campus indicated is subject to change and confirmation.
e. Intake for the qualification: January only.
f. Readmission: See Chapter 3 of Students’ Rules and Regulations.
g. Subject credits: Subject credits are shown in brackets after each subject.

YEAR SUBJECT

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMD100N</td>
<td>Research Methodology</td>
<td>(0,075)</td>
</tr>
</tbody>
</table>

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAD40AB</td>
<td>Business Administration IVA</td>
<td>(0,038)</td>
</tr>
<tr>
<td>ENT401B</td>
<td>Entrepreneurship IV</td>
<td>(0,075)</td>
</tr>
<tr>
<td>IES201T</td>
<td>Industrial Economics II</td>
<td>(0,075)</td>
</tr>
<tr>
<td>INK201T</td>
<td>International Marketing II</td>
<td>(0,075)</td>
</tr>
<tr>
<td>INL201T</td>
<td>International Law II</td>
<td>(0,075)</td>
</tr>
<tr>
<td>ISY401T</td>
<td>Information Systems IV</td>
<td>(0,075)</td>
</tr>
<tr>
<td>PJR401T</td>
<td>Project Research IV</td>
<td>(0,100)</td>
</tr>
<tr>
<td>THY401T</td>
<td>Technology Management (A) IV</td>
<td>(0,075)</td>
</tr>
</tbody>
</table>

SECON SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAD40BB</td>
<td>Business Administration IVB</td>
<td>(0,037)</td>
</tr>
<tr>
<td>BUL401T</td>
<td>Business Logistics IV</td>
<td>(0,075)</td>
</tr>
<tr>
<td>FCC201T</td>
<td>Finance and Cost Accounting II</td>
<td>(0,075)</td>
</tr>
<tr>
<td>PJE401T</td>
<td>Project Engineering IV</td>
<td>(0,075)</td>
</tr>
<tr>
<td>THY411T</td>
<td>Technology Management (B) IV</td>
<td>(0,075)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

7.8 SUBJECT INFORMATION

Syllabus content subject to change to accommodate industry changes.

SUBJECT NAME: AUTOMATION III
SUBJECT CODE: ATM301B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
SUBJECT NAME: BUSINESS ADMINISTRATION IVA
SUBJECT CODE: BAD40AB
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Basic business administration: accounting cycle function of bookkeeping, bookkeeping model. Trading firm: costs and returns, assets and liabilities, administration of assets. Production firm: cost classification, cost particularisation, marginal cost, results analysis.

SUBJECT NAME: BUSINESS ADMINISTRATION IVB
SUBJECT CODE: BAD40BB
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Basic business administration: accounting cycle function of bookkeeping, bookkeeping model. Trading firm: costs and returns, assets and liabilities, administration of assets. Production firm: cost classification, cost particularisation, marginal cost, results analysis.

SUBJECT NAME: BUSINESS LOGISTICS IV
SUBJECT CODE: BUL401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Decision-making models, stock control, prediction methods, logistics performance criteria, client-order-disconnecting-moment, typology of industrial organisations, design factory layout, material management and distribution. Production control: BSC, OPT, MRP, MRPII, JIT, Kanban, queuing, department control, material development, material handling, operational research (overview).

SUBJECT NAME: COMPUTER-AIDED DRAUGHTING I
SUBJECT CODE: CAI101T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Introduction to computer-aided draughting (CAD), various software packages, compound drawings.

SUBJECT NAME: COSTING II
SUBJECT CODE: CSG201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Basic methods and a group of selected techniques of cost accounting for application in the business environment. The subject consists of two modules.

SUBJECT NAME: ELECTROTECHNOLOGY I
SUBJECT CODE: ETT101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
The correct use of SI units and their applications. Construction and care of batteries. WS theory and different measuring instruments. The influence of magnetic lines, the application and use of magnetic fields, inductance and the factors that influence it. Capacitors and their functioning. (Subject taken from Engineering: Mechanical.)

SUBJECT NAME: ENGINEERING COMMUNICATION I
SUBJECT CODE: EGN101T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Communication theory, non-verbal communication (body language). Oral presentations, interviews, developing leadership and participation skills. Technical reports and correspondence.
INDUSTRIAL ENGINEERING

SUBJECT NAME: ENGINEERING COMMUNICATION I
SUBJECT CODE: EGN111T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Specific, discipline-related interpretation, presentation and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. The students will be introduced to aspects of scaffolded reading as a tool to acquire knowledge and interpretative abilities in their subject disciplines.

SUBJECT NAME: ENGINEERING WORK STUDY I
SUBJECT CODE: EWK121T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ENGINEERING WORK STUDY II
SUBJECT CODE: EWK221T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ENGINEERING WORK STUDY III
SUBJECT CODE: EWK321T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Performance improvement programs. Systems for management.

SUBJECT NAME: ENTREPRENEURSHIP IV
SUBJECT CODE: ENT401B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: EXPERIENTIAL LEARNING I
SUBJECT CODE: EXP11EN
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Workshop factors: labour machine technology (types and uses), workshop planning and control, inventory control and storage, drawing office practice (design and interpretation), maintenance. Industrial engineering aspects: method study, time studies, labour standards, distribution line analysis, labour schedules.
INDUSTRIAL ENGINEERING

SUBJECT NAME: EXPERIENTIAL LEARNING II
SUBJECT CODE: EXP2IEN
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: Not available

OVERVIEW OF SYLLABUS:
Work study. Quality assurance. Production. Systems. Facility layout and materials handling. The following fields could be covered: material-handling analysis, equipment specifications, selection and evaluation, mechanisation and automation, plant layout (analysis and renewal), office layout and planning, productivity (equipment utilisation studies and capacity analysis), form design and control, industrial systems analysis and design.

SUBJECT NAME: FACILITY LAYOUT AND MATERIALS HANDLING II
SUBJECT CODE: FLM201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available

OVERVIEW OF SYLLABUS:

SUBJECT NAME: FINANCE AND COST ACCOUNTING II
SUBJECT CODE: FCC201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available

OVERVIEW OF SYLLABUS:
Cost price calculation, profit, financial forecasting and budgeting, influence of risk on financial decisions, capital budgeting, dividend policy, capital structure, cash management models, international business finance, investment rules.

SUBJECT NAME: FOUNDATION ACADEMIC SKILLS
SUBJECT CODE: FPACA01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours

OVERVIEW OF SYLLABUS:
• The important aspects of life skills: Campus ethics, learning styles and whole-brain thinking, self-image and assertive behaviour, time management, self-motivation, conflict management, sexuality and relationships, problem-solving skills, managing stress, multicultural society, techniques for summarising and memorising, how to cope with assessments and assignments, creativity, and many more. The life-skills sessions are participative, with group discussions and personal application to optimise the student’s learning experience.
• The important aspects of English communication: Interpret, relate and reflect on all available and relevant resource material in proper English. Communicate orally in a comprehensible and clear manner in both general and subject-specific communication. Demonstrate intermediate-level proficiency in written English.
• An element of Computer Literacy is woven throughout the presentation of this subject as well as the Mathematics course. Students will be introduced to the basic functions of personal computing, Windows, word processors and other software, and engage in e-learning as a way of becoming familiar with this kind of technology.

SUBJECT NAME: FOUNDATION APPLIED SCIENCE
SUBJECT CODE: FPAPP01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours

OVERVIEW OF SYLLABUS:
An introduction to physics, statics, dynamics and electricity, dealing with the following topics: Atom theory, electricity, magnetism and electromagnetism, inductors, capacitors, RLC networks. Basic concepts of atomic bonds, crystal structures and material properties. Control over properties by heat treatment, microstructure and phase diagrams. Measuring material properties with mechanical tests like tensile tests, hardness tests, impact tests, etc. General forming processes, plastic strain, strain hardening, hot working, cold working, recrystallisation. Properties and uses of the

SUBJECT NAME: FOUNDATION COMPUTER-AIDED DRAUGHTING I
SUBJECT CODE: FPCAI01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 136 hours
OVERVIEW OF SYLLABUS:
Students will be introduced to: operating systems (Windows environment), basic word-processing skills (MS-Word), spreadsheets (MS-Excel), presentations tools (PowerPoint), communications, connectivity, the internet and the Web, computer-aided draughting (CAD), various software packages and compound drawings.

SUBJECT NAME: FOUNDATION ENGINEERING
SUBJECT CODE: FPEGI01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
An introduction to technical drawing as well as the type of skills, workplace environments and knowledge required in all the major fields of engineering that are practised in the South African economy.

SUBJECT NAME: FOUNDATION ENGINEERING COMMUNICATION I
SUBJECT CODE: FPEGN01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Speaking and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. Communication theory, non-verbal communication (body language). Oral presentations, interviews, developing leadership and participation skills. Technical reports and correspondence.

SUBJECT NAME: FOUNDATION ELECTROTECHNOLOGY I
SUBJECT CODE: FPETT01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Atom theory, electricity, magnetism and electromagnetism, inductors, capacitors, RLC networks. The correct use of SI units and their applications. Construction and care of batteries. WS theory and different measuring instruments. The influence of magnetic lines, the application and use of magnetic fields, inductance and the factors that influence it. Capacitors and their functioning.

SUBJECT NAME: FOUNDATION MATHEMATICS
SUBJECT CODE: FPMAT05
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
Basic algebra, functions, exponents and logarithm, differential calculus, trigonometry, geometry. Basic mathematics. Differentiation. Integration. Matrices and determinants. Vectors. Data handling. Complex numbers or mensuration. Students will be introduced to personal computers, Windows and e-learning technologies as a fundamental part of this subject.

SUBJECT NAME: FOUNDATION MATHEMATICS I
SUBJECT CODE: FPMAT04
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
SUBJECT NAME: FOUNDATION MECHANICAL ENGINEERING DRAWING I
SUBJECT CODE: FPMDR01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION MECHANICAL MANUFACTURING ENGINEERING I
SUBJECT CODE: FPMME01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION MECHANICS I
SUBJECT CODE: FPMHC01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: INDUSTRIAL ACCOUNTING III
SUBJECT CODE: IAC321T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: INDUSTRIAL ECONOMICS II
SUBJECT CODE: IES201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Constructing recycling model, buying motives of consumers, motives of producers, demand for market group, supply of market goods, functioning of the market mechanism, pricing of production factors, role of government and foreign countries in the economic process.

SUBJECT NAME: INDUSTRIAL LEADERSHIP III
SUBJECT CODE: ILE301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Leaders and management. Management planning, organising, leading and control.
SUBJECT NAME: INFORMATION SYSTEMS IV
SUBJECT CODE: ISY401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Structure and strategic organisational role. Computer systems resources. Decision support systems and executive information systems. Development and implementation of information systems.

SUBJECT NAME: INTERNATIONAL LAW II
SUBJECT CODE: INL201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
International law firm, magistrate’s court, debt collections, high court, solvent deceased estates, conveyancing, secretarial and notarial practice, Stamp Duties Act, companies and close corporations.

SUBJECT NAME: INTERNATIONAL MARKETING II
SUBJECT CODE: INK201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Economic rationale of multi-trade business, international monetary system, international finance and accounting. Regional market agreements, economic, cultural, political and legal environment. International marketing research, global marketplace, product policy and planning, international pricing strategy, channels of distribution, advertising, multinational sales management, organisation, control and marketing planning and strategy.

SUBJECT NAME: LOGISTICS ENGINEERING IV
SUBJECT CODE: LEN401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MANUFACTURING RELATIONS II
SUBJECT CODE: MFR201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MATHEMATICS I
SUBJECT CODE: MAT171T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MATHEMATICS I
SUBJECT CODE: MAT181T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive introduction to the theorems and applications of the differential calculus, trigonometry, algebra and matrices. Elementary data handling and vector calculations are also introduced with practical introductions to the applications specific to the engineering discipline in which the student is registered.
<table>
<thead>
<tr>
<th>SUBJECT NAME</th>
<th>EVALUATION METHOD</th>
<th>TOTAL TUITION TIME</th>
<th>OVERVIEW OF SYLLABUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDUSTRIAL ENGINEERING</td>
<td>1 X 3-OUR PAPER</td>
<td>Not available</td>
<td>Revision of differentiation (Mathematics I). Differentiation of functions with more than one variable. Further integration. Numerical methods. First-order ordinary differential equations. Matrices (Gauss elimination). (Subject taken from Engineering: Mechanical.)</td>
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<tr>
<td>MATHEMATICS II</td>
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<tr>
<td>SUBJEC CODE:</td>
<td>MAT271T</td>
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<td>SUBJECT NAME:</td>
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<tr>
<td>MECHANICAL ENGINEERING DESIGN II</td>
<td>1 X 3-HOUR PAPER</td>
<td>± 68 hours</td>
<td>General introduction to design. Basic design principles with respect to knuckle joints, cotter joint, rivetted seams, stop joints, thin cylinders, grid joints, gears, shafts, cotters, spokes for gears, bearings, shaft couplings, piping and pipe joints, eccentric loading on joints, welding, drawing projects. (Subject taken from Engineering: Mechanical.)</td>
</tr>
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<td>SUBJEC CODE:</td>
<td>MDR101B</td>
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<td></td>
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<tr>
<td>SUBJECT CODE:</td>
<td>MME111T</td>
<td></td>
<td>A detailed and comprehensive general introduction to manufacturing engineering. Safety in a workplace. Basic principles of manufacturing with respect to identifying various types of materials, measuring equipment, hand and machine tools, concentrating on more in-depth practical work. (Subject taken from Engineering: Mechanical.)</td>
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<tr>
<td>SUBJECT NAME:</td>
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<tr>
<td>SUBJECT CODE:</td>
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<td>SUBJECT NAME:</td>
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</table>
SUBJECT NAME: MECHANICS I
SUBJECT CODE: MHC101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Motion in one dimension. Uniform motion. Instantaneous velocity. Motion with constant acceleration.
Free fall. Instantaneous acceleration, scalars, vectors, coordinate systems and vector components,
vector algebra, force, Newton’s first law, Newton’s second law, Newton’s third law, ropes and pulleys,

SUBJECT NAME: MECHANICS I
SUBJECT CODE: MHC121T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 240 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to mechanics. Basic principles of mechanics
in respect of measurements and different units. Applications of basic moments, vehicle dynamics
and use of decimal figures.

SUBJECT NAME: OPERATIONAL RESEARCH III
SUBJECT CODE: ORS321T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Fundamentals of decision theory. Decision trees and utility theory. Marginal analysis and normal

SUBJECT NAME: PRODUCTION ENGINEERING: INDUSTRIAL I
SUBJECT CODE: PEI111T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: PRODUCTION ENGINEERING: INDUSTRIAL II
SUBJECT CODE: PEI211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: PRODUCTION TECHNOLOGY IV
SUBJECT CODE: PHY401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
SUBJECT NAME: PROJECT ENGINEERING IV
SUBJECT CODE: PJE401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: PROJECT RESEARCH IV
SUBJECT CODE: PJR401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: QUALITATIVE TECHNIQUES I
SUBJECT CODE: QTQ101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:

SUBJECT NAME: QUALITY ASSURANCE II
SUBJECT CODE: QAS201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Essentials of a quality management system. Statistical process control: introduction to quality improvement. The quality life cycle, introduction to statistical process control, basic statistical calculations, analyses and interpretation of control charts, control of attribute control charts, design of experiments, principles of statistical design and analysis, experiments.

SUBJECT NAME: QUALITY ASSURANCE II
SUBJECT CODE: QAS211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
An in-depth introduction to the environment, specific language, technology and mathematical (statistics) skill requirements of quality assurance in engineering with an emphasis on reporting and presentation skills using the recognised software.

SUBJECT NAME: QUALITY ASSURANCE IV
SUBJECT CODE: QAS401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
SUBJECT NAME: RESEARCH METHODOLOGY
SUBJECT CODE: RMD100N
EVALUATION METHOD: PROJECT
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Introduction to research, the methodology of research and research strategies. The ability to undertake a research assignment independently in a unique speciality area. The physical gathering of data and analysing data statistically and otherwise.

SUBJECT NAME: SYSTEMS DYNAMICS IV
SUBJECT CODE: SDN411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Introduction to and fundamentals of modelling, system definitions and model formulation, model validation and analysis, interpretation of simulation outputs. Station submodels and entity transfer. Animation of simulation model with the help of cinema. Advanced discrete modelling concepts, advanced manufacturing features. Coupling to user subprograms. Continuous and combined models. Variant reduction techniques.

SUBJECT NAME: TECHNOLOGY MANAGEMENT (A) IV
SUBJECT CODE: THY401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Communicative structures, mechanisms of behaviour, teamwork (leadership and membership), selection techniques, negotiating, problem-solving and decision-making, presentations.

SUBJECT NAME: TECHNOLOGY MANAGEMENT (B) IV
SUBJECT CODE: THY411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS:
Operations management: research, investment, production marketing, finance and accounting. Strategic management: innovating, renewing or discontinuing productions, mergers, closing, buying or selling companies.
8. DEPARTMENT OF MECHANICAL ENGINEERING

GENERIC STIPULATIONS WITH REGARD TO THE QUALIFICATIONS ISSUED:

Offering of qualifications
The purpose of the qualification is to train and qualify top-quality technicians and technologists in the field of mechanical engineering in South Africa. On completion of his/her studies, after at least three years of study, the student can receive the National Diploma: Engineering: Mechanical. After completing a further year of study, the Baccalaureus Tehnologiae: Engineering: Mechanical will be awarded.

All the qualifications currently offered by the Department of Mechanical Engineering at the Tshwane University of Technology are fully accredited by the Engineering Council of South Africa (ECSA), as well as the South African Qualifications Authority (SAQA). After a student has completed his/her studies, he/she may apply for professional registration at ECSA. Registration with ECSA gives the qualification international status and recognition in other countries through the current Sydney and Dublin Accords.

Enrolment
All first-year students enrol for the National Diploma: Engineering: Mechanical, as outlined below.

The work of an engineering professional generally includes the following:
 i. General engineering – identification and analysis of problems and problem-solving.
 ii. Management and communication – individually and in the working environment, and specific to the discipline and target industry.
 iii. Application of engineering and ethical work practice – including evaluation of ability, competency and work of oneself and others.

The Purpose of the National Diploma: Engineering: Mechanical includes the following:
• Use and interpretation of mathematical formulas used in engineering calculations.
• The ability to perform statistical analyses by using standard methods.
• Interpretation and evaluation of results.
• Use of basic scientific principles in engineering.
• Engineering science applicable to the appropriate subdiscipline.
• Knowledge that addresses the target industry’s specific needs.
• Formative education, which includes critical cross-field outcomes through a cooperative education system in which full integration of experimental learning in a real-life industrial environment complements the independent academic, classroom and integrated laboratory work.
• Development of manipulative and functional skills.
• Development of a culture of self-learning and the continuing acquisition of knowledge and skills that is necessary to solve, in a developing work environment, real and industrial problems through the application of currently known technology integration of technical knowledge and skills, and to develop thinking skills that equip the student to achieve the desired results through the qualification.

GENERIC OUTCOMES OF THE NATIONAL DIPLOMA: ENGINEERING: MECHANICAL

Exit-level outcome 1: Problem-solving
Apply engineering principles to systematically diagnose and solve well-defined engineering problems.

Exit-level outcome 2: Application of scientific and engineering knowledge
Demonstrate the application of mathematical, scientific and engineering knowledge in an engineering environment.

Exit-level outcome 3: Engineering design
Perform procedural design of well-defined components, systems, works, products or processes to meet desired needs in accordance with the applicable standards, code of practice and legislation.

Exit-level outcome 4: Communication
Communicate technical, supervisory and general management information effectively, both orally and in writing, by using appropriate language and terminology, structure, style and graphic support.
Exit-level outcome 5: Engineering management
Apply self-management principles and concepts to the development of projects and/or operations in an engineering environment.

Exit-level outcome 6: Application of complementary knowledge
Demonstrate a critical awareness of the impact of engineering activities on the social, industrial and physical environment, and of the need to act professionally within own limit of competence.

The purpose of the Baccalaureus Technologiae: Engineering: Mechanical includes the following (conforming to requirements specified by ECSA):

- Use mathematics to solve technical problems.
- Support reasoning in technical subjects.
- Evaluation of results of calculations.
- The ability to perform statistical analyses.
- Basic science that focuses on needs of specialist technology areas and supports reasoning concerning engineering phenomena.
- Engineering that focuses on knowledge relating to specialist fields in relevant areas and supports interaction with other specialists and generalists.
- At least 30% of the qualification is based on project work, involving the solution of real, industrial and applied problems, using fundamental principles that underpin current technology. Analytical thinking and technical and managerial skills are used in the application of knowledge used in solving complex.
- The initiatives that will lead to obtaining additional knowledge and skills that will ensure the advancement of technology.

GENERIC OUTCOMES OF THE BACCALAUREUS TECHNOLOGIAE: ENGINEERING: MECHANICAL

Exit-level outcome 1: Problem-solving
Apply engineering principles to systematically diagnose and solve broadly defined engineering problems.

Exit-level outcome 2: Application of scientific and engineering knowledge
Demonstrate the application of mathematical, scientific and engineering knowledge in an engineering environment.

Exit-level outcome 3: Engineering design
Perform procedural and non-procedural design of broadly defined components, systems, works, products or processes to meet desired needs in accordance with applicable standards, codes of practice and legislation.

Exit-level outcome 4: Communication
Communicate technical, supervisory and general management information effectively, both orally and in writing, by using appropriate language and terminology, structure, style and graphical support.

8.1 NATIONAL DIPLOMA: ENGINEERING: MECHANICAL (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)
(Pending final approval – DoE)
Qualification code: NDMEF1

REMARKS

a. Admission requirement(s) and selection criteria:

- FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:
  
  Admission requirement(s): A Senior Certificate or an equivalent qualification, with F symbols at the Higher Grade or E symbols at the Standard Grade for English, Mathematics and Physical Science.

  Recommended subject(s): Computer Science.
Selection criteria:
Prospective students who meet the above requirements, will sit for an admission test. Admission to either the formal qualification or a preparation programme is determined by a combination of the results of the admission test and the Senior Certificate marks. The offer to a prospective student of a place expires six months after the date on which the admission test is written.

• FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:
  See qualification NDME05.

b. Minimum duration: Four years.

c. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

d. Intake for the qualification: January and July.

e. Readmission: See Chapter 3 of Students’ Rules and Regulations.

f. Experiential Learning I and II: See Chapter 5 of Students’ Rules and Regulations.

g. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

FIRST YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPACA01</td>
<td>Foundation Academic Skills</td>
<td>(0,100)</td>
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<tr>
<td>FPAPP01</td>
<td>Foundation Applied Science</td>
<td>(0,050)</td>
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</tr>
<tr>
<td>FPEGI01</td>
<td>Foundation Engineering</td>
<td>(0,050)</td>
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<tr>
<td>FPMAT05</td>
<td>Foundation Mathematics</td>
<td>(0,050)</td>
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<td></td>
<td>TOTAL CREDITS FOR THE SEMESTER:</td>
<td>0,250</td>
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SECOND SEMESTER

After completing all of the above subjects.

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<thead>
<tr>
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<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
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<tbody>
<tr>
<td>EGN111T</td>
<td>Engineering Communication I</td>
<td>(0,086)</td>
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<tr>
<td>ETT111T</td>
<td>Electrotechnology I</td>
<td>(0,068)</td>
<td></td>
</tr>
<tr>
<td>MAT181T</td>
<td>Mathematics I</td>
<td>(0,086)</td>
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<tr>
<td>MDR101T</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0,068)</td>
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<tr>
<td>MHC121T</td>
<td>Mechanics I</td>
<td>(0,068)</td>
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<td>TOTAL CREDITS FOR THE SEMESTER:</td>
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TOTAL CREDITS FOR THE FIRST YEAR: 0,626

SECOND YEAR

FIRST SEMESTER

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<tbody>
<tr>
<td>CAI101T</td>
<td>Computer-Aided Draughting I</td>
<td>(0,068)</td>
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<tr>
<td>MAT281T</td>
<td>Mathematics II</td>
<td>(0,086)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MMH221T</td>
<td>Mechanics of Machines II</td>
<td>(0,086)</td>
<td>Mechanics I</td>
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<td>MME101T</td>
<td>Mechanical Manufacturing Engineering I</td>
<td>(0,068)</td>
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<tr>
<td>SMT221T</td>
<td>Strength of Materials II</td>
<td>(0,086)</td>
<td>Mathematics I</td>
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<td>TOTAL CREDITS FOR THE SEMESTER:</td>
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SECOND SEMESTER

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>FMS231T</td>
<td>Fluid Mechanics II</td>
<td>0.086</td>
</tr>
<tr>
<td>MED211T</td>
<td>Mechanical Engineering Design II</td>
<td>0.086</td>
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<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MAT351T</td>
<td>Mathematics III</td>
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<tr>
<td>TDN211T</td>
<td>Thermodynamics II</td>
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**plus one of the following subjects:**

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENY101T</td>
<td>Electronic Technology</td>
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</tr>
<tr>
<td>ETT211T</td>
<td>Electrotechnology II</td>
<td>0.083</td>
</tr>
<tr>
<td>MME201T</td>
<td>Mechanical Manufacturing Engineering II</td>
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**TOTAL CREDITS FOR THE SEMESTER:** 0.424

**TOTAL CREDITS FOR THE SECOND YEAR:** 0.818

THIRD YEAR

FIRST SEMESTER

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<tbody>
<tr>
<td>FMS331T</td>
<td>Fluid Mechanics III</td>
<td>0.083</td>
</tr>
<tr>
<td>MED321T</td>
<td>Mechanical Engineering Design III</td>
<td>0.083</td>
</tr>
<tr>
<td>MMH331T</td>
<td>Mechanics of Machines III</td>
<td>0.083</td>
</tr>
<tr>
<td>SMT331T</td>
<td>Strength of Materials III</td>
<td>0.083</td>
</tr>
<tr>
<td>TDN321T</td>
<td>Thermodynamics III</td>
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**TOTAL CREDITS FOR THE SEMESTER:** 0.415

SECOND SEMESTER

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<td>Applied Strength of Materials III</td>
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</tr>
<tr>
<td>HYM301T</td>
<td>Hydraulic Machines III</td>
<td>0.083</td>
</tr>
<tr>
<td>SMP301T</td>
<td>Steam Plant III</td>
<td>0.083</td>
</tr>
<tr>
<td>TMH301T</td>
<td>Theory of Machines III</td>
<td>0.083</td>
</tr>
</tbody>
</table>

**plus one of the following subjects:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNF301T</td>
<td>Control of Machines</td>
<td>0.083</td>
</tr>
<tr>
<td>EIE301T</td>
<td>Electric Machines</td>
<td>0.083</td>
</tr>
<tr>
<td>MME301T</td>
<td>Mechanical Manufacturing Engineering III</td>
<td>0.083</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.415

**TOTAL CREDITS FOR THE THIRD YEAR:** 0.830
FOURTH YEAR

FIRST SEMESTER

EXP1ENM Experiential Learning I (0,363)

TOTAL CREDITS FOR THE SEMESTER: 0,363

SECOND SEMESTER

EXP2ENM Experiential Learning II (0,363) Experiential Learning I

TOTAL CREDITS FOR THE SEMESTER: 0,363

TOTAL CREDITS FOR THE FOURTH YEAR: 0,726

8.2 NATIONAL DIPLOMA: ENGINEERING: MECHANICAL (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION) (Pending final approval – Senate)

Qualification code: NDMEF0

NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2009. STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL 2014 TO OBTAIN IT, SUBJECT TO THE STIPULATIONS OF REGULATION 3.1.1 ON THE MAXIMUM DURATION OF STUDY.

Phase-out date: 31 December 2014

Presentation and Campus:
Pretoria Campus (day classes).
Please note that the campus indicated is subject to change and confirmation.

Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

FIRST YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPCAI01</td>
<td>Foundation Computer-Aided Draughting I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>FPEGN01</td>
<td>Foundation Engineering Communication I</td>
<td>(0,008)</td>
<td></td>
</tr>
<tr>
<td>FPETT01</td>
<td>Foundation Electrotechnology I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>FPMAT04</td>
<td>Foundation Mathematics I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>FPMDR01</td>
<td>Foundation Mechanical Engineering Drawing I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>FPMHC01</td>
<td>Foundation Mechanics I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>FPMME01</td>
<td>Foundation Mechanical Manufacturing Engineering I</td>
<td>(0,083)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE FIRST YEAR: 0,506

SECOND YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMS211T</td>
<td>Fluid Mechanics II</td>
<td>(0,083)</td>
<td>Foundation Mathematics I</td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0,083)</td>
<td>Foundation Mechanics I</td>
</tr>
<tr>
<td>MMH211T</td>
<td>Mechanics of Machines II</td>
<td>(0,083)</td>
<td>Foundation Mechanics I</td>
</tr>
<tr>
<td>SMT211T</td>
<td>Strength of Materials II</td>
<td>(0,083)</td>
<td>Foundation Mathematics I</td>
</tr>
<tr>
<td>TDN201T</td>
<td>Thermodynamics II</td>
<td>(0,083)</td>
<td>Foundation Mechanics I</td>
</tr>
</tbody>
</table>
plus one of the following subjects:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENY101T</td>
<td>Electronic Technology</td>
<td>(0.083)</td>
</tr>
<tr>
<td>ETT211T</td>
<td>Electrotechnology II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MME201T</td>
<td>Mechanical Manufacturing Engineering II</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

Foundation Mathematics I
Foundation Electrotechnology I
Foundation Computer-Aided Draughting I
Foundation Mechanical Engineering Drawing I
Foundation Mechanical Manufacturing Engineering I

TOTAL CREDITS FOR THE SEMESTER: 0.498

SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMS331T</td>
<td>Fluid Mechanics III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MAT351T</td>
<td>Mathematics III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MED201T</td>
<td>Mechanical Engineering Design II</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

Foundation Engineering Communication I
Foundation Engineering Fluid Mechanics II
Mathematics II
Foundation Computer-Aided Draughting I
Foundation Engineering Communication I
Foundation Mechanical Engineering Drawing I
Foundation Mechanical Manufacturing Engineering I
Foundation Mechanics I
Strength of Materials II
Foundation Engineering Communication I
Mechanics of Machines II
Foundation Engineering Communication I
Strength of Materials II
Foundation Engineering Communication I
Mechanics of Machines II

MMH331T Mechanics of Machines III (0.083)
SMT331T Strength of Materials III (0.083)
TDN321T Thermodynamics III (0.083)

TOTAL CREDITS FOR THE SEMESTER: 0.498

TOTAL CREDITS FOR THE SECOND YEAR: 0.996

THIRD YEAR
After completion of all the subjects in the first year.

FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA301T</td>
<td>Applied Strength of Materials III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>HYM301T</td>
<td>Hydraulic Machines III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MED321T</td>
<td>Mechanical Engineering Design III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>SMP301T</td>
<td>Steam Plant III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>TMH301T</td>
<td>Theory of Machines III</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

Mathematics II
Strength of Materials III
Fluid Mechanics III
Mathematics II
Mathematics II
Mechanical Engineering Design II
Mechanics of Machines II
Mathematics II
Mechanics of Machines II

MECHANICAL ENGINEERING
plus one of the following subjects:

- CNF301T Control of Machines (0,083) Mathematics III
- EIE301T Electric Machines (0,083) Electrotechnology II
- MME301T Mechanical Manufacturing Engineering III (0,083) Mechanical Manufacturing Engineering II

**TOTAL CREDITS FOR THE SEMESTER:** 0,498

**SECOND SEMESTER**

- EXP1ENM Experiential Learning I (0,500)

**TOTAL CREDITS FOR THE SEMESTER:** 0,500

**TOTAL CREDITS FOR THE THIRD YEAR:** 0,998

**FOURTH YEAR**

**FIRST SEMESTER**

- EXP2ENM Experiential Learning II (0,500) Experiential Learning I

**TOTAL CREDITS FOR THE SEMESTER:** 0,500

**TOTAL CREDITS FOR THE FOURTH YEAR:** 0,500

---

**8.3 NATIONAL DIPLOMA: ENGINEERING: MECHANICAL**

Qualification code: NDME05

**REMARKS**

a. Admission requirement(s): For students who obtained a Senior Certificate before 2008:

   A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics and an E symbol at the Higher Grade or a D symbol at the Standard Grade for Physical Science.

   For students who have obtained a National Senior Certificate since 2008:

   A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

b. Recommended subject(s): None.

c. Selection criteria: Admission Point Score (APS) and assessment procedures:

   Candidates with an APS score of 24+ will be admitted to the National Diploma or the National Diploma (Extended Curriculum). A candidate's performance in an academic placement test written in January as part of the Faculty's orientation programme will determine whether he or she will be channelled to the National Diploma or National Diploma (Extended Curriculum).

**FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)
FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
<tr>
<td>TOTAL APS SCORE (six subjects, excluding Life Orientation)</td>
<td>24</td>
</tr>
</tbody>
</table>

d. Minimum duration: Three years.
e. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.
f. Intake for the qualification: January and July.
g. Readmission: See Chapter 3 of Students’ Rules and Regulations.
h. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).
i. Experiential Learning I and II: See Chapter 5 of Students’ Rules and Regulations.
j. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks:
* Information does not correspond to information in Report 151.
(Deviations approved by the Senate in August 2005 and May 2008.)

FIRST YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI101T</td>
<td>Computer-Aided Draughting I*</td>
<td>(0,068)*</td>
<td></td>
</tr>
<tr>
<td>EGN101T</td>
<td>Engineering Communication I*</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>ETT101T</td>
<td>Electrotechnology I</td>
<td>(0,068)*</td>
<td></td>
</tr>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>MDR101T</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0,068)*</td>
<td></td>
</tr>
<tr>
<td>MHC101T</td>
<td>Mechanics I</td>
<td>(0,068)*</td>
<td></td>
</tr>
<tr>
<td>MME101T</td>
<td>Mechanical Manufacturing Engineering I</td>
<td>(0,068)*</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,506

SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMS211T</td>
<td>Fluid Mechanics II</td>
<td>(0,083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0,083)</td>
<td>Mechanics I</td>
</tr>
<tr>
<td>MMH211T</td>
<td>Mechanics of Machines II</td>
<td>(0,083)</td>
<td>Mechanics I</td>
</tr>
<tr>
<td>SMT211T</td>
<td>Strength of Materials II</td>
<td>(0,083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>TDN201T</td>
<td>Thermodynamics II</td>
<td>(0,083)</td>
<td>Mechanics I</td>
</tr>
</tbody>
</table>
MECHANICAL ENGINEERING

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENY101T</td>
<td>Electronic Technology</td>
<td>(0.083)*</td>
</tr>
<tr>
<td>ETT211T</td>
<td>Electrotechnology II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MME201T</td>
<td>Mechanical Manufacturing Engineering II</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.498
TOTAL CREDITS FOR THE FIRST YEAR: 1.004

SECOND YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMS331T</td>
<td>Fluid Mechanics III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MAT351T</td>
<td>Mathematics III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MED201T</td>
<td>Mechanical Engineering Design II</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

MMH331T     | Mechanics of Machines III                  | (0.083) |
SMT331T     | Strength of Materials III                  | (0.083) |
TDN321T     | Thermodynamics III                         | (0.083) |

TOTAL CREDITS FOR THE SEMESTER: 0.498

SECOND SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA301T</td>
<td>Applied Strength of Materials III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>HYM301T</td>
<td>Hydraulic Machines III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MED321T</td>
<td>Mechanical Engineering Design III</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

SMP301T     | Steam Plant III                            | (0.083) |
TMH301T     | Theory of Machines III                     | (0.083) |

plus one of the following subjects:

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNF301T</td>
<td>Control of Machines</td>
<td>(0.083)*</td>
</tr>
<tr>
<td>EIE301T</td>
<td>Electric Machines</td>
<td>(0.083)*</td>
</tr>
<tr>
<td>MME301T</td>
<td>Mechanical Manufacturing Engineering III</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.498
TOTAL CREDITS FOR THE SECOND YEAR: 0.996
THIRD YEAR

FIRST SEMESTER

EXP1ENM Experiential Learning I (0,500)
TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

EXP2ENM Experiential Learning II (0,500) Experiential Learning I
TOTAL CREDITS FOR THE SEMESTER: 0,500
TOTAL CREDITS FOR THE THIRD YEAR: 1,000

8.4 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: MECHANICAL
Qualification code: BTME05

REMARKS

a. Admission requirement(s): A National Diploma: Engineering: Mechanical with an average of 60% or higher for the exit-level diploma subjects or an NQF level 6 bachelor’s degree in Mechanical Engineering obtained from a South African university. However, this does not apply to students who registered for the National Diploma for the first time before 2007, and who have not interrupted their studies.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Admissions will be based on the evaluation of a portfolio of evidence, as well as an interview with the Head of the Department and/or a selection panel.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes). Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.

f. Readmission: See Chapter 3 of Students’ Rules and Regulations.

g. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

h. Subject credits: Subject credits are shown in brackets after each subject.
FIRST OR SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDP400T</td>
<td>Engineering Design Project IV</td>
<td>(0,250)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(year subject)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The subjects below are offered in semesters, as determined by the Department.

plus two of the following subjects:

- FMS411T Fluid Mechanics IV (0,125) Hydraulic Machines III
- MMH411T Mechanics of Machines IV (0,125) Mathematics III
- SMT411T Strength of Materials IV (0,125) Theory of Machines III
- TDN401T Thermodynamics IV (0,125) Applied Strength of Materials III

plus two of the remaining subjects above and two of the following subjects or four of the following subjects:

- ATC411T Automatic Control IV (0,125) Mathematics III
- MFE401T Manufacturing Engineering IV (0,125) Theory of Machines III
- RAC401T Refrigeration and Air Conditioning IV (0,125) Mechanical Manufacturing Engineering III
- SAN401T Stress Analysis IV (0,125) Steam Plant III
- TRM401T Turbo Machines IV (0,125) Applied Strength of Materials III

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

8.5 NATIONAL DIPLOMA: ENGINEERING: MECHANICAL AND NATIONAL DIPLOMA: ENGINEERING: ELECTRICAL

Qualification code: NDDM01


NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2009. STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL 2016 TO OBTAIN IT, SUBJECT TO THE STIPULATIONS OF REGULATION 3.1.1 ON THE MAXIMUM DURATION OF STUDY.

Phase-out date: 31 December 2016

Campus where offered: eMalahleni and Pretoria campuses.
Please note that the campuses indicated are subject to change and confirmation.

Key to asterisks
* Information does not correspond to information in Report 151.
(Deviations approved by the Senate in August 2005 and May 2008.)
<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COS101T</td>
<td>Communication Skills I</td>
<td>(0.050)</td>
<td></td>
</tr>
<tr>
<td>CSK101C</td>
<td>Computer Skills I</td>
<td>(0.050)</td>
<td></td>
</tr>
<tr>
<td>EEN111T</td>
<td>Electrical Engineering I</td>
<td>(0.100)</td>
<td></td>
</tr>
<tr>
<td>ELC111T</td>
<td>Electronics I</td>
<td>(0.100)</td>
<td></td>
</tr>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
<td>(0.100)</td>
<td></td>
</tr>
<tr>
<td>MDR101T</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0.061)*</td>
<td></td>
</tr>
<tr>
<td>MHC101T</td>
<td>Mechanics I</td>
<td>(0.060)*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL CREDITS FOR THE SEMESTER:</td>
<td>0.521</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI101T</td>
<td>Computer-Aided Draughting I*</td>
<td>(0.050)*</td>
<td></td>
</tr>
<tr>
<td>DSY131T</td>
<td>Digital Systems I</td>
<td>(0.100)</td>
<td></td>
</tr>
<tr>
<td>EEN211T</td>
<td>Electrical Engineering II</td>
<td>(0.100)</td>
<td>Electrical Engineering I</td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0.100)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MME101T</td>
<td>Mechanical Manufacturing Engineering I</td>
<td>(0.050)*</td>
<td></td>
</tr>
<tr>
<td>PGG111T</td>
<td>Programming I</td>
<td>(0.100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL CREDITS FOR THE SEMESTER:</td>
<td>0.500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL CREDITS FOR THE FIRST YEAR:</td>
<td>1.021</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSY231T</td>
<td>Digital Systems II</td>
<td>(0.100)</td>
<td>Digital Systems I</td>
</tr>
<tr>
<td>EEN311T</td>
<td>Electrical Engineering III</td>
<td>(0.100)</td>
<td>Electrical Engineering II</td>
</tr>
<tr>
<td>ELC211T</td>
<td>Electronics II</td>
<td>(0.100)</td>
<td>Electronics I</td>
</tr>
<tr>
<td>EMA241T</td>
<td>Electrical Machines II</td>
<td>(0.100)</td>
<td>Electrical Engineering II</td>
</tr>
<tr>
<td>SMT211T</td>
<td>Strength of Materials II</td>
<td>(0.083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td></td>
<td>TOTAL CREDITS FOR THE SEMESTER:</td>
<td>0.483</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL CREDITS FOR THE SECOND YEAR:</td>
<td>1.032</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPJ301T</td>
<td>Design Project III</td>
<td>(0.100)</td>
<td>Digital Systems II</td>
</tr>
<tr>
<td>ELD331T</td>
<td>Electrical Distribution III</td>
<td>(0.100)</td>
<td>Electrical Engineering II</td>
</tr>
<tr>
<td>FMS211T</td>
<td>Fluid Mechanics II</td>
<td>(0.083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MMH211T</td>
<td>Mechanics of Machines II</td>
<td>(0.083)</td>
<td>Mechanics I</td>
</tr>
<tr>
<td>PWE311T</td>
<td>Power Electronics III</td>
<td>(0.100)</td>
<td>Electronics II</td>
</tr>
<tr>
<td>TDN201T</td>
<td>Thermodynamics II</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL CREDITS FOR THE SEMESTER:</td>
<td>0.549</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SECOND YEAR: 1,032
THIRD YEAR

FIRST SEMESTER

FMS331T Fluid Mechanics III (0,083) Communication Skills I
MAT351T Mathematics III (0,100) Mathematics II
MED201T Mechanical Engineering Design II (0,083) Communication Skills I
MMH331T Mechanics of Machines III (0,083)
SMT331T Strength of Materials III (0,083)
TDN321T Thermodynamics III (0,083)

TOTAL CREDITS FOR THE SEMESTER: 0,515

SECOND SEMESTER

ASA301T Applied Strength of Materials III (0,083) Mathematics II
EMA341T Electrical Machines III (0,100) Strength of Materials II
HYM301T Hydraulic Machines III (0,083) Electrical Machines II
SMP301T Steam Plant III (0,083) Fluid Mechanics III
TMH301T Theory of Machines III (0,083) Mathematics II

TOTAL CREDITS FOR THE SEMESTER: 0,432

TOTAL CREDITS FOR THE THIRD YEAR: 0,947

FOURTH YEAR

FIRST SEMESTER

EXP1EME Experiential Learning I (0,500)

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

EXP2EME Experiential Learning II (0,500) Experiential Learning I

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE FOURTH YEAR: 1,000

FIFTH YEAR

FIRST SEMESTER

EXP2ENM Experiential Learning II (0,500) Experiential Learning I

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE FIFTH YEAR: 0,500

TOTAL CREDITS FOR THE QUALIFICATION: 4,500
### 8.6 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: MECHANICAL AND BACCALAUREUS TECHNOLOGIAE: ENGINEERING: ELECTRICAL

Qualification code: BTDM96


NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2009. STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL 2010 TO OBTAIN IT, SUBJECT TO THE STIPULATIONS OF REGULATION 3.1.1 ON THE MAXIMUM DURATION OF STUDY.

Phase-out date: 31 December 2010

Campus where offered:
eMalahleni and Pretoria campuses.

Please note that the campuses indicated are subject to change and confirmation.

Key to asterisks
* Information does not correspond to information in Report 151.
  (Deviations approved by the Senate in August 2005.)

### FIRST OR SECOND SEMESTER

The subjects below are offered in semesters as determined by the Department.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGM411T</td>
<td>Engineering Management IV</td>
<td>(0,100)</td>
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</tr>
<tr>
<td>EMA411T</td>
<td>Electrical Machines IV</td>
<td>(0,100)</td>
<td>Electrical Machines III</td>
</tr>
<tr>
<td>EMT451T</td>
<td>Engineering Mathematics IV</td>
<td>(0,100)</td>
<td>Mathematics III</td>
</tr>
<tr>
<td>FMS411T</td>
<td>Fluid Mechanics IV</td>
<td>(0,125)</td>
<td>Hydraulic Machines III</td>
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<tr>
<td>MMH411T</td>
<td>Mechanics of Machines IV</td>
<td>(0,125)</td>
<td>Mathematics III</td>
</tr>
</tbody>
</table>

PWE411T                 Power Electronics IV  (0,100)  Power Electronics III
SMT411T                 Strength of Materials IV (0,125)  Applied Strength of Materials III

TDN401T                 Thermodynamics IV      (0,125)  Mathematics III

plus one of the following subjects:

EDP400T                 Engineering Design Project IV (0,250)
(year subject)

or

IPR410T                 Industrial Project IV (year subject) (0,250)*
IPR412R                 Industrial Project IV (re-registration) (0,000)

plus two of the following subjects:

ATC411T                 Automatic Control IV (0,125)  Mathematics III
RAC401T                 Refrigeration and Air Conditioning IV (0,125)  Theory of Machines III
SAN401T                 Stress Analysis IV (0,125)  Steam Plant III
TRM401T                 Turbo Machines IV (0,125)  Applied Strength of Materials III

Mathematics III

Steam Plant III

Hydraulic Machines III
8.7 NATIONAL DIPLOMA: ENGINEERING: MECHANICAL  
(Field of specialisation: Automotive)  
Qualification code: NDMA07  

NB: THIS IS NOT THE APPROVED NAME OF THE QUALIFICATION, ITS APPROVED NAME IS: NATIONAL DIPLOMA: ENGINEERING: MECHANICAL  
THIS QUALIFICATION WILL BE ISSUED AS SOON AS A STUDENT MEETS ALL THE PRESCRIBED REQUIREMENTS.

REMARKS

a. Admission requirement(s):  
For students who obtained a Senior Certificate before 2008:  
A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics and an E symbol at the Higher Grade or a D symbol at the Standard Grade for Physical Science.  
For students who have obtained a National Senior Certificate since 2008:  
A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

b. Recommended subject(s): None.

c. Selection criteria: Admission Point Score (APS) and assessment procedures:

Candidates with an APS score of 24+ will be admitted to the National Diploma or the National Diploma (Extended Curriculum). A candidate’s performance in an academic placement test written in January as part of the Faculty’s orientation programme will determine whether he or she will be channelled to the National Diploma or National Diploma (Extended Curriculum).

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)
FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
<tr>
<td>TOTAL APS SCORE (six subjects, excluding Life Orientation)</td>
<td>24</td>
</tr>
</tbody>
</table>

d. Minimum duration: Three years.
e. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.
f. Intake for the qualification: January and July.
g. Readmission: See Chapter 3 of Students’ Rules and Regulations.
h. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).
i. Experiential Learning I and II: See Chapter 5 of Students’ Rules and Regulations.
j. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks:
* Information does not correspond to information in Report 151.
  (Deviations approved by SENEX on 14 August 2006 and the Senate in May 2008.)
** Information does not correspond with information in Report 151.
  (Deviations approved by the Senate in August 2005 for the phasing out programme.)

FIRST YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI101T</td>
<td>Computer-Aided Draughting I*</td>
<td>(0.066)*</td>
<td></td>
</tr>
<tr>
<td>EGN101T</td>
<td>Engineering Communication I*</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>ETT101T</td>
<td>Electrotechnology I</td>
<td>(0.068)*</td>
<td></td>
</tr>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>MDR101T</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0.068)*</td>
<td></td>
</tr>
<tr>
<td>MHC101T</td>
<td>Mechanics I</td>
<td>(0.068)*</td>
<td></td>
</tr>
<tr>
<td>MME101T</td>
<td>Mechanical Manufacturing Engineering I</td>
<td>(0.068)*</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.504
## SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELC111T</td>
<td>Electronics I</td>
<td>(0.083)**</td>
</tr>
<tr>
<td>FMS211T</td>
<td>Fluid Mechanics II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MVE111T</td>
<td>Motor Vehicle Engineering I</td>
<td>(0.083)</td>
</tr>
<tr>
<td>SMT211T</td>
<td>Strength of Materials II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>TDN201T</td>
<td>Thermodynamics II</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.498

## TOTAL CREDITS FOR THE FIRST YEAR: 1.002

## SECOND YEAR

### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSY131T</td>
<td>Digital Systems I</td>
<td>(0.083)**</td>
</tr>
<tr>
<td>ELC211T</td>
<td>Electronics II</td>
<td>(0.083)**</td>
</tr>
<tr>
<td>FMS331T</td>
<td>Fluid Mechanics III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MAT351T</td>
<td>Mathematics III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MMH211T</td>
<td>Mechanics of Machines II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>TDN321T</td>
<td>Thermodynamics III</td>
<td>(0.083)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.498

## TOTAL CREDITS FOR THE SECOND YEAR: 0.998

### SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>AEE301T</td>
<td>Auto-Electrical Engineering III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>DSY231T</td>
<td>Digital Systems II</td>
<td>(0.083)**</td>
</tr>
<tr>
<td>HYM301T</td>
<td>Hydraulic Machines III</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MED201T</td>
<td>Mechanical Engineering Design II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>MVE211T</td>
<td>Motor Vehicle Engineering II</td>
<td>(0.083)</td>
</tr>
<tr>
<td>SMP301T</td>
<td>Steam Plant III</td>
<td>(0.085)*</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.500

TOTAL CREDITS FOR THE SECOND YEAR: 0.998
THIRD YEAR

FIRST SEMESTER

EXP1ENM Experiential Learning I (0,500)

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

EXP2ENM Experiential Learning II (0,500) Experiential Learning I

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE THIRD YEAR: 1,000

8.8 NATIONAL DIPLOMA: ENGINEERING: MECHANICAL
(Field of specialisation: Manufacturing)
Qualification code: NDMM05

NB: THIS IS NOT THE APPROVED NAME OF THE QUALIFICATION, ITS APPROVED
NAME IS: NATIONAL DIPLOMA: ENGINEERING: MECHANICAL

THIS QUALIFICATION WILL BE ISSUED AS SOON AS A STUDENT MEETS ALL THE
PRESCRIBED REQUIREMENTS.

REMARKS

a. Admission requirement(s): For students who obtained a Senior Certificate before 2008:
A Senior Certificate or an equivalent qualification, with D symbols
at the Higher Grade or C symbols at the Standard Grade for
English and Mathematics and an E symbol at the Higher Grade
or a D symbol at the Standard Grade for Physical Science.
For students who have obtained a National Senior
Certificate since 2008:
A National Senior Certificate or an
equivalent qualification, with English (4), Mathematics (4) and
Physical Sciences (3).

b. Recommended subject(s): None.

c. Selection criteria: Admission Point Score (APS) and assessment procedures:
Candidates with an APS score of 24+ will be admitted to the
National Diploma or the National Diploma (Extended Curriculum).
A candidate’s performance in an academic placement test written
in January as part of the Faculty’s orientation programme will
determine whether he or she will be channelled to the National
Diploma or National Diploma (Extended Curriculum).

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE
BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>A</td>
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<tr>
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<tr>
<td>3</td>
<td>E</td>
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<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)
FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL APS SCORE** (six subjects, excluding Life Orientation) | 24

d. Minimum duration: Three years.

e. Presentation and campus: Pretoria Campus (day classes).
Please note that the campus indicated is subject to change and confirmation.

f. Intake for the qualification: January and July.

g. Readmission: See Chapter 3 of Students’ Rules and Regulations.

h. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

i. Experiential Learning I and II: See Chapter 5 of Students’ Rules and Regulations.

j. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks:
* Information does not correspond to information in Report 151.
(Deviations approved by the Senate in August 2005, June 2006 and May 2008.)

**FIRST YEAR**

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI101T</td>
<td>Computer-Aided Draughting I*</td>
<td>(0,068)*</td>
<td></td>
</tr>
<tr>
<td>EGN101T</td>
<td>Engineering Communication I*</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>ETT101T</td>
<td>Electrotechnology I</td>
<td>(0,068)*</td>
<td></td>
</tr>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
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<td></td>
</tr>
<tr>
<td>MDR101T</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0,068)*</td>
<td></td>
</tr>
<tr>
<td>MHC101T</td>
<td>Mechanics I</td>
<td>(0,068)*</td>
<td></td>
</tr>
<tr>
<td>MME101T</td>
<td>Mechanical Manufacturing Engineering I</td>
<td>(0,068)*</td>
<td></td>
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</table>

**TOTAL CREDITS FOR THE SEMESTER:** 0.506
### SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETT211T</td>
<td>Electrotechnology II</td>
<td>(0.083)</td>
<td>Electrotechnology I</td>
</tr>
<tr>
<td>FMS211T</td>
<td>Fluid Mechanics II</td>
<td>(0.083)</td>
<td>Mechanics I</td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0.083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MME201T</td>
<td>Mechanical Manufacturing</td>
<td>(0.083)</td>
<td>Computer-Aided Draughting I</td>
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<tr>
<td></td>
<td>Engineering II</td>
<td></td>
<td>Mechanical Engineering Drawing I</td>
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<td>Mechanical Manufacturing</td>
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<tr>
<td></td>
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<td></td>
<td>Engineering I</td>
</tr>
<tr>
<td>MMH211T</td>
<td>Mechanics of Machines II</td>
<td>(0.083)</td>
<td>Mechanics I</td>
</tr>
<tr>
<td>SMT211T</td>
<td>Strength of Materials II</td>
<td>(0.083)</td>
<td>Mechanics I</td>
</tr>
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</table>

**TOTAL CREDITS FOR THE SEMESTER: 0.498**

### SECOND YEAR

### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT351T</td>
<td>Mathematics III</td>
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<td>Mathematics II</td>
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<td>MED201T</td>
<td>Mechanical Engineering Design II</td>
<td>(0.083)</td>
<td>Computer-Aided Draughting I</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Engineering Communication I</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mechanical Engineering Drawing I</td>
</tr>
<tr>
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<td>Mechanical Manufacturing</td>
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<td></td>
<td></td>
<td>Engineering I</td>
</tr>
<tr>
<td>MME301T</td>
<td>Mechanical Manufacturing</td>
<td>(0.083)</td>
<td>Mechanical Manufacturing</td>
</tr>
<tr>
<td>MMH331T</td>
<td>Mechanics of Machines III</td>
<td>(0.083)</td>
<td>Engineering III</td>
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<td></td>
<td>Engineering Communication I</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mechanics of Machines II</td>
</tr>
<tr>
<td>SMT331T</td>
<td>Strength of Materials III</td>
<td>(0.083)</td>
<td>Engineering Communication I</td>
</tr>
<tr>
<td>TDN201T</td>
<td>Thermodynamics II</td>
<td>(0.083)</td>
<td>Strength of Materials II</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER: 0.498**

### SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA301T</td>
<td>Applied Strength of Materials III</td>
<td>(0.083)</td>
<td>Mathematics II</td>
</tr>
<tr>
<td>CNF301T</td>
<td>Control of Machines</td>
<td>(0.083)*</td>
<td>Strength of Materials III</td>
</tr>
<tr>
<td>FMS331T</td>
<td>Fluid Mechanics III</td>
<td>(0.083)</td>
<td>Mathematics III</td>
</tr>
<tr>
<td>MED321T</td>
<td>Mechanical Engineering Design III</td>
<td>(0.083)</td>
<td>Engineering Communication I</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fluid Mechanics II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mathematics II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mechanical Engineering Design II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mechanical Manufacturing</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Management III</td>
</tr>
<tr>
<td>MMU301T</td>
<td>Mechanical Manufacturing</td>
<td>(0.083)</td>
<td>Mathematics II</td>
</tr>
<tr>
<td></td>
<td>Engineering III</td>
<td></td>
<td>Mechanics of Machines II</td>
</tr>
<tr>
<td>TMH301T</td>
<td>Theory of Machines III</td>
<td>(0.083)</td>
<td>Mechanics of Machines III</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE SEMESTER: 0.498**

**TOTAL CREDITS FOR THE SECOND YEAR: 0.996**
THIRD YEAR

FIRST SEMESTER

EXP1ENM Experiential Learning I (0,500)

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

EXP2ENM Experiential Learning II (0,500)

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE THIRD YEAR: 1,000

8.9 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: MECHANICAL
(Field of specialisation: Manufacturing)
Qualification code: BTMM05

NB: THIS IS NOT THE APPROVED NAME OF THE QUALIFICATION, ITS APPROVED NAME IS: BACCALAUREUS TECHNOLOGIAE: ENGINEERING: MECHANICAL

THIS QUALIFICATION WILL BE ISSUED AS SOON AS A STUDENT MEETS ALL THE PRESCRIBED REQUIREMENTS.

REMARKS

a. Admission requirement(s): A National Diploma: Engineering: Mechanical with an average of 60% or higher for the exit-level diploma subjects or an NQF level 6 bachelor’s degree in Mechanical Engineering obtained from a South African university. However, this does not apply to students who registered for the National Diploma for the first time before 2007, and who have not interrupted their studies.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Admission is subject to selection.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes). Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.

f. Readmission: See Chapter 3 of Students’ Rules and Regulations.
g. Accreditation by professional body: This qualification has been accredited by the Engineering Council of South Africa (ECSA).

h. Subject credits: Subject credits are shown in brackets after each subject.

**FIRST OR SECOND SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDP400T</td>
<td>Engineering Design Project IV (year subject)</td>
<td>(0,250)</td>
<td></td>
</tr>
</tbody>
</table>

The subjects below are offered in semesters as determined by the Department.

- MFE401T Manufacturing Engineering IV (0,125) Mechanical Manufacturing Engineering III
- MGY401T Machine Tool Theory IV (0,125) Mechanical Manufacturing Engineering III
- MMH411T Mechanics of Machines IV (0,125) Mathematics III Theory of Machines III
- SMT411T Strength of Materials IV (0,125) Applied Strength of Materials III Mathematics III

plus two of the following subjects:

- ATC411T Automatic Control IV (0,125) Mathematics III Theory of Machines III
- MFG401T Manufacturing Management IV (0,125) Mechanical Manufacturing Management III
- SAN401T Stress Analysis IV (0,125) Applied Strength of Materials III Mathematics III

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

---

8.10 **NATIONAL DIPLOMA: ENGINEERING: MECHATRONICS (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)**

(Pending final approval – DoE)

**Qualification code: NDMRF1**

**REMARKS**

a. Admission requirement(s) and selection criteria:

- **FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

  Admission requirement(s): A Senior Certificate or an equivalent qualification, with F symbols at the Higher Grade or E symbols at the Standard Grade for English, Mathematics and Physical Science.

  Recommended subject(s): Computer Science.

  Selection criteria: Prospective students who meet the above requirements, will sit for an admission test. Admission to either the formal qualification or a preparation programme is determined by a combination of the results of the admission test and the Senior Certificate marks. The offer to a prospective student of a place expires six months after the date on which the admission test is written.
• FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:
  See qualification NDMR06.

b. Minimum duration: Four years.

c. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

d. Intake for the qualification: January and July.

e. Readmission: See Chapter 3 of Students’ Rules and Regulations.

f. Experiential learning I and II: See Chapter 5 of Students’ Rules and Regulations.

g. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

**FIRST YEAR**

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPACA01</td>
<td>Foundation Academic Skills</td>
<td>(0,100)</td>
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</tr>
<tr>
<td>FPAPP01</td>
<td>Foundation Applied Science</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>FPEGI01</td>
<td>Foundation Engineering</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>FPMAT05</td>
<td>Foundation Mathematics</td>
<td>(0,050)</td>
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</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,250

**SECOND SEMESTER**

After completing all of the above subjects.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGN111T</td>
<td>Engineering Communication I</td>
<td>(0,086)</td>
<td></td>
</tr>
<tr>
<td>ETT111T</td>
<td>Electrotechnology I</td>
<td>(0,068)</td>
<td></td>
</tr>
<tr>
<td>MAT181T</td>
<td>Mathematics I</td>
<td>(0,086)</td>
<td></td>
</tr>
<tr>
<td>MHC121T</td>
<td>Mechanics I</td>
<td>(0,068)</td>
<td></td>
</tr>
<tr>
<td>MDR101T</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0,068)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,376

TOTAL CREDITS FOR THE FIRST YEAR: 0,626

**SECOND YEAR**

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI101T</td>
<td>Computer-Aided Draughting I</td>
<td>(0,068)</td>
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</tr>
<tr>
<td>ENY101T</td>
<td>Electronic Technology</td>
<td>(0,086)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MAT281T</td>
<td>Mathematics II</td>
<td>(0,086)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MMH221T</td>
<td>Mechanics of Machines II</td>
<td>(0,086)</td>
<td>Mechanics I</td>
</tr>
<tr>
<td>MME101T</td>
<td>Mechanical Manufacturing</td>
<td>(0,068)</td>
<td>Engineering I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,394

MECHANICAL ENGINEERING
<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIT111T</td>
<td>Digital Technology I</td>
<td>0.085</td>
</tr>
<tr>
<td>ETT211T</td>
<td>Electrotechnology II</td>
<td>0.086</td>
</tr>
<tr>
<td>MAT351T</td>
<td>Mathematics III</td>
<td>0.086</td>
</tr>
<tr>
<td>MSS101T</td>
<td>Materials and Processing</td>
<td>0.085</td>
</tr>
<tr>
<td>SMT111T</td>
<td>Strength of Materials I</td>
<td>0.086</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CREDITS FOR THE SEMESTER:</strong></td>
<td><strong>0.428</strong></td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CREDITS FOR THE SECOND YEAR:</strong></td>
<td><strong>0.822</strong></td>
</tr>
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</table>

**THIRD YEAR**

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNF301T</td>
<td>Control of Machines</td>
<td>0.080</td>
</tr>
<tr>
<td>CSD201T</td>
<td>Computer Studies</td>
<td>0.080</td>
</tr>
<tr>
<td>DIT211T</td>
<td>Digital Technology II</td>
<td>0.080</td>
</tr>
<tr>
<td>MED101T</td>
<td>Mechanical Engineering Design</td>
<td>0.080</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CREDITS FOR THE SEMESTER:</strong></td>
<td><strong>0.400</strong></td>
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**SECOND SEMESTER**

<table>
<thead>
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<th>CREDITS</th>
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<tbody>
<tr>
<td>EIE301T</td>
<td>Electric Machines</td>
<td>0.080</td>
</tr>
<tr>
<td>MCD301T</td>
<td>Mechatronic Engineering Design</td>
<td>0.080</td>
</tr>
<tr>
<td>MHC201T</td>
<td>Mechanics II</td>
<td>0.080</td>
</tr>
<tr>
<td>NUA301T</td>
<td>Networks and Communication</td>
<td>0.080</td>
</tr>
<tr>
<td>SMT211B</td>
<td>Strength of Materials II</td>
<td>0.080</td>
</tr>
<tr>
<td>SOA301T</td>
<td>Sensors and Process Control</td>
<td>0.080</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CREDITS FOR THE SEMESTER:</strong></td>
<td><strong>0.480</strong></td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CREDIT FOR THE THIRD YEAR:</strong></td>
<td><strong>0.880</strong></td>
</tr>
</tbody>
</table>

**FOURTH YEAR**

**FIRST SEMESTER**

<table>
<thead>
<tr>
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<th>COURSE TITLE</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP1MRF</td>
<td>Experiential Learning I</td>
<td>0.336</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CREDITS FOR THE SEMESTER:</strong></td>
<td><strong>0.336</strong></td>
</tr>
</tbody>
</table>

**SECOND SEMESTER**

<table>
<thead>
<tr>
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<th>COURSE TITLE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>EXP2MRF</td>
<td>Experiential Learning II</td>
<td>0.336</td>
</tr>
<tr>
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<td><strong>TOTAL CREDITS FOR THE SEMESTER:</strong></td>
<td><strong>0.336</strong></td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CREDITS FOR THE FOURTH YEAR:</strong></td>
<td><strong>0.672</strong></td>
</tr>
</tbody>
</table>
8.11 NATIONAL DIPLOMA: ENGINEERING: MECHATRONICS (EXTENDED CURRICULUM PROGRAMME WITH FOUNDATION PROVISION)
(Pending final approval – Senate)
Qualification code: NDMRF0

NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2009.
STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL
2014 TO OBTAIN IT, SUBJECT TO THE STIPULATIONS OF REGULATION 3.1.1 ON THE
MAXIMUM DURATION OF STUDY.

Phase-out date: 31 December 2014

Presentation and Campus:
Pretoria Campus (day classes).
Please note that the campus indicated is subject to change and confirmation.

Subject credits are shown in brackets after each subject. The total number of credits required for
this qualification is 3,000.

FIRST YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
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<tbody>
<tr>
<td>FPEGN02</td>
<td>Foundation Engineering</td>
<td>(0,050)</td>
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<tr>
<td></td>
<td>Communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FPETT01</td>
<td>Foundation Electrotechnology I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>FPMAT04</td>
<td>Foundation Mathematics I</td>
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<td></td>
</tr>
<tr>
<td>FPMDR02</td>
<td>Foundation Mechanical Engineering</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drawing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FPMFE01</td>
<td>Foundation Manufacturing</td>
<td>(0,150)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FPMHC01</td>
<td>Foundation Mechanics I</td>
<td>(0,100)</td>
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</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE FIRST YEAR: 0,600

SECOND YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
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<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDD101T</td>
<td>Computer-Aided Design</td>
<td>(0,100)</td>
<td>Foundation Mathematics I</td>
</tr>
<tr>
<td>ENV101T</td>
<td>Electronic Technology</td>
<td>(0,100)</td>
<td>Foundation Electrotechnology I</td>
</tr>
<tr>
<td>ETT211T</td>
<td>Electrotechnology II</td>
<td>(0,100)</td>
<td>Foundation Mathematics I</td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0,150)</td>
<td>Foundation Manufacturing Engineering</td>
</tr>
<tr>
<td>MSS101T</td>
<td>Materials and Processing</td>
<td>(0,150)</td>
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</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,550

SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIT101T</td>
<td>Digital Technology I</td>
<td>(0,100)</td>
<td>Foundation Mathematics I</td>
</tr>
<tr>
<td>MAT351T</td>
<td>Mathematics III</td>
<td>(0,100)</td>
<td>Mathematics II</td>
</tr>
<tr>
<td>MHC201T</td>
<td>Mechanics II</td>
<td>(0,100)</td>
<td>Foundation Mathematics I</td>
</tr>
<tr>
<td>SMT101T</td>
<td>Strength of Materials I</td>
<td>(0,100)</td>
<td>Foundation Mechanics I</td>
</tr>
<tr>
<td>THF201T</td>
<td>Thermo-Flow</td>
<td>(0,100)</td>
<td>Foundation Mechanics I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDIT FOR THE SECOND YEAR: 1,050
THIRD YEAR
After completion of all the subjects in the first year.

FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNF301T</td>
<td>Control of Machines</td>
<td>(0,100)</td>
</tr>
<tr>
<td>CSD201T</td>
<td>Computer Studies</td>
<td>(0,100)</td>
</tr>
<tr>
<td>DIT201T</td>
<td>Digital Technology II</td>
<td>(0,100)</td>
</tr>
<tr>
<td>EIE301T</td>
<td>Electric Machines</td>
<td>(0,100)</td>
</tr>
<tr>
<td>MED101T</td>
<td>Mechanical Engineering Design</td>
<td>(0,100)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCD301T</td>
<td>Mechatronic Engineering Design</td>
<td>(0,100)</td>
</tr>
<tr>
<td>MHC301T</td>
<td>Mechanics III</td>
<td>(0,100)</td>
</tr>
<tr>
<td>NUA301T</td>
<td>Networks and Communication</td>
<td>(0,100)</td>
</tr>
<tr>
<td>SMT211B</td>
<td>Strength of Materials II</td>
<td>(0,100)</td>
</tr>
<tr>
<td>SOA301T</td>
<td>Sensors and Process Control</td>
<td>(0,100)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE THIRD YEAR: 1,000

FOURTH YEAR

FIRST SEMESTER
Students must pass all the above subjects in order to continue with the following subject:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP1MEC</td>
<td>Mechatronic Engineering Practice (Experiential Learning)</td>
<td>(0,350)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,350

TOTAL CREDITS FOR THE FOURTH YEAR: 0,350
REMARKS

a. Admission requirement(s): 
   For students who obtained a Senior Certificate before 2008: A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics and an E symbol at the Higher Grade or a D symbol at the Standard Grade for Physical Science.
   For students who have obtained a National Senior Certificate since 2008: A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).

b. Recommended subject(s): None.

c. Selection criteria 
   Admission Point Score (APS) and assessment procedures:
   Candidates with an APS score of 24+ will be admitted to the National Diploma or the National Diploma (Extended Curriculum). A candidate’s performance in an academic placement test written in January as part of the Faculty’s orientation programme will determine whether he or she will be channelled to the National Diploma or National Diploma (Extended Curriculum).

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
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<tbody>
<tr>
<td>7</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
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<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)

FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
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<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
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<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
<tr>
<td>TOTAL APS SCORE (six subjects, excluding Life Orientation)</td>
<td>24</td>
</tr>
</tbody>
</table>
f. Intake for the qualification: January and July.

g. Readmission: See Chapter 3 of Students’ Rules and Regulations.

h. Accreditation by professional body: This qualification has been provisionally accredited by the Engineering Council of South Africa (ECSA).


j. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

**FIRST YEAR**

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGN101B</td>
<td>Engineering Communication</td>
<td>(0,050)</td>
<td></td>
</tr>
<tr>
<td>ETT101T</td>
<td>Electrotechnology I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>MDR111T</td>
<td>Mechanical Engineering Drawing</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>MFE101C</td>
<td>Manufacturing Engineering</td>
<td>(0,150)</td>
<td></td>
</tr>
<tr>
<td>MHC101C</td>
<td>Mechanics I</td>
<td>(0,100)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,600

**SECOND SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDD101T</td>
<td>Computer-Aided Design</td>
<td>(0,100)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>ENY101T</td>
<td>Electronic Technology</td>
<td>(0,100)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>ETT211T</td>
<td>Electrotechnology II</td>
<td>(0,100)</td>
<td>Electrotechnology I</td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0,100)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MSS101T</td>
<td>Materials and Processing</td>
<td>(0,150)</td>
<td>Manufacturing Engineering</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,550

TOTAL CREDITS FOR THE FIRST YEAR: 1,150

**SECOND YEAR**

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIT101T</td>
<td>Digital Technology I</td>
<td>(0,100)</td>
<td>Electronic Technology</td>
</tr>
<tr>
<td>MAT351T</td>
<td>Mathematics III</td>
<td>(0,100)</td>
<td>Mathematics II</td>
</tr>
<tr>
<td>MHC201T</td>
<td>Mechanics II</td>
<td>(0,100)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>SMT101T</td>
<td>Strength of Materials I</td>
<td>(0,100)</td>
<td>Mechanics I</td>
</tr>
<tr>
<td>THF201T</td>
<td>Thermo-Flow</td>
<td>(0,100)</td>
<td>Mathematics II</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500
SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNF301T</td>
<td>Control of Machines</td>
<td>(0,100)</td>
</tr>
<tr>
<td>CSD201T</td>
<td>Computer Studies</td>
<td>(0,100)</td>
</tr>
<tr>
<td>DIT201T</td>
<td>Digital Technology II</td>
<td>(0,100)</td>
</tr>
<tr>
<td>EIE301T</td>
<td>Electric Machines</td>
<td>(0,100)</td>
</tr>
<tr>
<td>MED101T</td>
<td>Mechanical Engineering Design</td>
<td>(0,100)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE SECOND YEAR: 1,000

THIRD YEAR

FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCD301T</td>
<td>Mechatronic Engineering Design</td>
<td>(0,100)</td>
</tr>
<tr>
<td>MHC301T</td>
<td>Mechanics III</td>
<td>(0,100)</td>
</tr>
<tr>
<td>NUA301T</td>
<td>Networks and Communication</td>
<td>(0,100)</td>
</tr>
<tr>
<td>SMT211B</td>
<td>Strength of Materials II</td>
<td>(0,100)</td>
</tr>
<tr>
<td>SOA301T</td>
<td>Sensors and Process Control</td>
<td>(0,100)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

Students must pass all the above subjects in order to continue with the following subject:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP1MEC</td>
<td>Mechatronic Engineering Practice (Experiential Learning)</td>
<td>(0,350)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,350

TOTAL CREDITS FOR THE THIRD YEAR: 0,850
8.13 NATIONAL DIPLOMA: ENGINEERING: MECHANICAL  
(Field of specialisation: Mechatronics)  
Qualification code: NDMR01  

NB: THIS IS NOT THE APPROVED NAME OF THE QUALIFICATION, ITS APPROVED NAME IS: NATIONAL DIPLOMA: ENGINEERING: MECHANICAL  
THIS QUALIFICATION WILL BE ISSUED AS SOON AS A STUDENT MEETS ALL THE PRESCRIBED REQUIREMENTS.  

NO NEW REGISTRATIONS FOR THIS QUALIFICATION ARE ACCEPTED AS FROM 2006. STUDENTS WHO ARE CURRENTLY REGISTERED FOR THIS QUALIFICATION HAVE UNTIL 2010 TO OBTAIN IT, SUBJECT TO THE STIPULATIONS OF REGULATION 3.1.1 ON THE MAXIMUM DURATION OF STUDY.  

Phase-out date: 31 December 2010  

Campus where offered:  
Pretoria Campus.  
Please note that the campus indicated is subject to change and confirmation.  

Key to asterisks  
* Information does not correspond to information in Report 151.  
(Deviations approved by SENEX on 29 August 2005 and the Senate in May 2008.)  

FIRST YEAR  
FIRST SEMESTER  

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI101T</td>
<td>Computer-Aided Draughting I*</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>EGN101T</td>
<td>Engineering Communication I*</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>ETT101T</td>
<td>Electrotechnology I</td>
<td>(0,074)*</td>
<td></td>
</tr>
<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
<td>(0,083)</td>
<td></td>
</tr>
<tr>
<td>MDR101T</td>
<td>Mechanical Engineering Drawing I</td>
<td>(0,073)*</td>
<td></td>
</tr>
<tr>
<td>MHC101T</td>
<td>Mechanics I</td>
<td>(0,073)*</td>
<td></td>
</tr>
<tr>
<td>MME101T</td>
<td>Mechanical ManufacturingEngineering I</td>
<td>(0,073)*</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,542  

SECOND SEMESTER  

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSY141T</td>
<td>Digital Systems I</td>
<td>(0,015)*</td>
<td></td>
</tr>
<tr>
<td>ELC121T</td>
<td>Electronics I</td>
<td>(0,015)*</td>
<td></td>
</tr>
<tr>
<td>ETT211T</td>
<td>Electrotechnology II</td>
<td>(0,083)</td>
<td>Electrotechnology I</td>
</tr>
<tr>
<td>FMS211T</td>
<td>Fluid Mechanics II</td>
<td>(0,083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>MAT271T</td>
<td>Mathematics II</td>
<td>(0,083)</td>
<td>Mathematics I</td>
</tr>
<tr>
<td>SMT211T</td>
<td>Strength of Materials II</td>
<td>(0,083)</td>
<td>Mechanics I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0,362  

TOTAL CREDITS FOR THE FIRST YEAR: 0,904
SECOND YEAR

FIRST SEMESTER

DSY241T Digital Systems II (0,015)*
EMA241T Electrical Machines II (0,083)*
MAT351T Mathematics III (0,083)
MED201T Mechanical Engineering Design II (0,083)

MMH211T Mechanics of Machines II (0,083)
SFD211T Software Design II (0,083)*

TOTAL CREDITS FOR THE SEMESTER: 0,430

SECOND SEMESTER

DSY351T Digital Systems III (0,085)*
EMA341B Electrical Machines III (0,083)*
FCS301T Fluid Control Systems III (0,083)
MED321T Mechanical Engineering Design III (0,083)

MMH331T Mechanics of Machines III (0,083)
SMT331T Strength of Materials III (0,083)

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE SECOND YEAR: 0,930

THIRD YEAR

FIRST SEMESTER

ASA301T Applied Strength of Materials III (0,083)
EXP1ENM Experiential Learning I (0,500)
TMH301T Theory of Machines III (0,083)

TOTAL CREDITS FOR THE SEMESTER: 0,666

SECOND SEMESTER

EXP2ENM Experiential Learning II (0,500)

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE THIRD YEAR: 1,166
8.14 BACCALAUREUS TECHNOLOGIAE: ENGINEERING: MECHANICAL
(Field of specialisation: Mechatronics)
Qualification code: BTMR05/BTMR09

REMARKS

a. Admission requirement(s): A National Diploma: Engineering: Mechanical with an average of 60% or higher for the exit-level diploma subjects or an NQF level 6 bachelor’s degree in Mechanical Engineering obtained from a South African university. However, this does not apply to students who registered for the National Diploma for the first time before 2007, and who have not interrupted their studies.

Holders of any other equivalent South African or foreign qualifications may also be considered, but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation by the South African Qualifications Authority (SAQA) of their qualifications. The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required.

b. Selection criteria: Admission will be based on the evaluation of a portfolio of evidence, as well as an interview with the Head of the Department and/or a selection panel.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes). Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.

f. Readmission: See Chapter 3 of Students’ Rules and Regulations.

g. Subject credits: Subject credits are shown in brackets after each subject.

Key to asterisks
* Information does not correspond to information in Report 151.
(Deviations approved by the SENEX on 29 August 2005.)

OPTION 1: ONLY FOR STUDENTS WHO COMPLETED THE NATIONAL DIPLOMA:
ENGINEERING: MECHATRONICS (NDMR06)

FIRST OR SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA301T</td>
<td>Applied Strength of Materials III</td>
<td>(0,083)</td>
<td>Mathematics II</td>
</tr>
<tr>
<td>ATC411B</td>
<td>Automatic Control IV</td>
<td>(0,125)</td>
<td>Mathematics III</td>
</tr>
<tr>
<td>DCS401T</td>
<td>Digital Control Systems IV</td>
<td>(0,100)</td>
<td>Automatic Control IV</td>
</tr>
<tr>
<td>EDP400T</td>
<td>Engineering Design Project IV</td>
<td>(0,342)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(year subject)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SFD301T</td>
<td>Software Design III</td>
<td>(0,100)</td>
<td>Software Design II</td>
</tr>
<tr>
<td>TDN401T</td>
<td>Thermodynamics IV</td>
<td>(0,125)</td>
<td>Mathematics III</td>
</tr>
</tbody>
</table>
plus one of the following subjects:

SAN401T Stress Analysis IV (0,125) Applied Strength of Materials III Mathematics III
SMT411T Strength of Materials IV (0,125) Applied Strength of Materials III Mathematics III

TOTAL CREDITS FOR OPTION 1: 1,000

OPTION 2: ONLY FOR STUDENTS WHO COMPLETED THE NATIONAL DIPLOMA: ENGINEERING: MECHANICAL (FIELD OF SPECIALISATION: MECHATRONICS) (NDMR01)

FIRST OR SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDP400T</td>
<td>Engineering Design Project IV (year subject)</td>
<td>(0,300)*</td>
<td></td>
</tr>
</tbody>
</table>

The subjects below are offered in semesters, as determined by the Department.

ATC411B Automatic Control IV (0,125) Mathematics III Theory of Machines III
DCS401T Digital Control Systems IV (0,100) Automatic Control IV
MMH411T Mechanics of Machines IV (0,125) Mathematics III Theory of Machines III
SAN401T Stress Analysis IV (0,125) Applied Strength of Materials III Mathematics III
SMT411T Strength of Materials IV (0,125) Applied Strength of Materials III Mathematics III

plus one of the following subjects:

PWE311T Power Electronics III (0,100) Electrical Machines II
SFD301T Software Design III (0,100) Mathematics III Software Design II

TOTAL CREDITS FOR OPTION 2: 1,000

8.15 MAGISTER TECHNOLOGIAE: ENGINEERING: MECHANICAL
Qualification code: MTME95

REMARKS

a. Admission requirement(s): A Baccalaureus Technologiae: Engineering: Mechanical or an NQF level 7 bachelor’s or honours degree in Mechanical Engineering obtained from a South African university.

   Holders of any other equivalent South African or foreign qualification may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of one year and a maximum of three years.

d. Presentation and campus: Pretoria Campus (research).

Please note that the campus indicated is subject to change and confirmation.
Subject credits: Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCC510T</td>
<td>Dissertation: Engineering: Mechanical</td>
<td>(1,000)</td>
</tr>
<tr>
<td>MCC510R</td>
<td>Dissertation: Engineering: Mechanical (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

8.16 DOCTOR TECHNOLOGIAE: ENGINEERING: MECHANICAL
Qualification code: DTME96

REMARKS
a. Admission requirement(s): A Magister Technologiae: Engineering: Industrial or an NQF level 8 master’s degree in Mechanical Engineering obtained from a South African university.

Holders of any other equivalent South African or foreign master’s degree may also be considered but they will have to apply in advance (± six months) for recognition of such qualifications. Foreign students will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA). The Faculty reserves the right to assess these qualifications and the applicant’s suitability for admission to the programme.

b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of two years and a maximum of five years.

d. Presentation and campus: Pretoria Campus (research).

Please note that the campus indicated is subject to change and confirmation.

e. Subject credits: Subject credits are shown in brackets after each subject.

<table>
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<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCC710T</td>
<td>Thesis: Engineering: Mechanical</td>
<td>(2,000)</td>
</tr>
<tr>
<td>MCC710R</td>
<td>Thesis: Engineering: Mechanical (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 2,000

8.17 NATIONAL DIPLOMA: POLYMER TECHNOLOGY
Qualification code: NDPY03

REMARKS
a. Admission requirement(s): For students who obtained a Senior Certificate before 2008: A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics and an E symbol at the Higher Grade or a D symbol at the Standard Grade for Physical Science. For students who have obtained a National Senior Certificate since 2008: A National Senior Certificate or an equivalent qualification, with English (4), Mathematics (4) and Physical Sciences (3).
b. Recommended subject(s): None.

c. Selection criteria: Admission Point Score (APS) and assessment procedures:

Candidates with an APS score of 24+ will be admitted to the National Diploma or the National Diploma (Extended Curriculum). A candidate’s performance in an academic placement test written in January as part of the Faculty’s orientation programme will determine whether he or she will be channelled to the National Diploma or National Diploma (Extended Curriculum).

FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
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</thead>
<tbody>
<tr>
<td>7</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>C</td>
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<tr>
<td>3</td>
<td>E</td>
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<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)

FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any three other subjects with a final score of 13</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL APS SCORE** (six subjects, excluding Life Orientation) | 24

d. Minimum duration: Three years.

e. Presentation and campus: Pretoria Campus (day classes).

Please note that the campus indicated is subject to change and confirmation.

f. Intake for the qualification: January only.

g. Readmission: See Chapter 3 of Students' Rules and Regulations.

h. Polymer Production Practice I, II and III (experiential learning):

i. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

Key to asterisks:
* Information does not correspond to information in Report 151. The old Report 151 has been used for auditing purposes for the National Diploma.
(Deviations approved by the Senate in August 2005.)
## SUBJECTS ARE OFFERED IN BOTH SEMESTERS

### FIRST YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE141B</td>
<td>Chemistry IA</td>
<td>(0.166)</td>
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<tr>
<td>MAT171T</td>
<td>Mathematics I</td>
<td>(0.083)</td>
<td></td>
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<tr>
<td>PHU161B</td>
<td>Physics IA</td>
<td>(0.083)</td>
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<tr>
<td>PTL111T</td>
<td>Polymer Technology I</td>
<td>(0.083)</td>
<td></td>
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<tr>
<td>PTP111T</td>
<td>Polymer Technology: Practical I</td>
<td>(0.083)</td>
<td></td>
</tr>
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</table>

TOTAL CREDITS FOR THE SEMESTER: 0.498

#### SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
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<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PYR101T</td>
<td>Polymer Production Practice I</td>
<td>(0.500)</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.500

TOTAL CREDITS FOR THE FIRST YEAR: 0.998

### SECOND YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
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</tr>
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<tbody>
<tr>
<td>DCE111T</td>
<td>Drawing: Chemical Engineering I</td>
<td>(0.083)</td>
<td></td>
</tr>
<tr>
<td>OCH221T</td>
<td>Organic Chemistry II</td>
<td>(0.083)</td>
<td>Chemistry IA</td>
</tr>
<tr>
<td>PME201T</td>
<td>Plastics Material Science II</td>
<td>(0.083)</td>
<td>Physics IA</td>
</tr>
<tr>
<td>PMP201T</td>
<td>Plastics Material Science: Practical II</td>
<td>(0.083)</td>
<td>Physics IA</td>
</tr>
<tr>
<td>PTL211T</td>
<td>Polymer Technology II</td>
<td>(0.083)</td>
<td>Polymer Technology I</td>
</tr>
<tr>
<td>PTP211T</td>
<td>Polymer Technology: Practical II</td>
<td>(0.083)</td>
<td>Polymer Technology: Practical I</td>
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</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.498

#### SECOND SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PYR201T</td>
<td>Polymer Production Practice II</td>
<td>(0.500)</td>
<td>Polymer Production Practice I</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.500

TOTAL CREDITS FOR THE SECOND YEAR: 0.998

### THIRD YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCP301T</td>
<td>Polymer Chemistry: Practical III</td>
<td>(0.071)</td>
<td>Organic Chemistry II</td>
</tr>
<tr>
<td>PLC311T</td>
<td>Production Planning and Control III</td>
<td>(0.071)</td>
<td></td>
</tr>
<tr>
<td>PME301T</td>
<td>Plastics Material Science III</td>
<td>(0.071)</td>
<td>Plastics Material Science II</td>
</tr>
<tr>
<td>PMP301T</td>
<td>Plastics Material Science: Practical III</td>
<td>(0.071)</td>
<td>Plastics Material Science: Practical II</td>
</tr>
<tr>
<td>PTL311T</td>
<td>Polymer Technology III</td>
<td>(0.078)*</td>
<td>Polymer Technology II</td>
</tr>
<tr>
<td>PTP311T</td>
<td>Polymer Technology: Practical III</td>
<td>(0.071)</td>
<td>Polymer Technology II</td>
</tr>
<tr>
<td>PYC301T</td>
<td>Polymer Chemistry III</td>
<td>(0.071)</td>
<td>Organic Chemistry II</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SEMESTER: 0.504
SECOND SEMESTER

PYR301T  Polymer Production Practice III  (0,500)  Polymer Production Practice II

TOTAL CREDITS FOR THE SEMESTER:  0,500

TOTAL CREDITS FOR THE THIRD YEAR:  1,004

8.18 BACCALAUREUS TECHNOLOGIAE: POLYMER TECHNOLOGY
Qualification code: BTPY03

REMARKS

a. Admission requirement(s): A National Diploma: Polymer Technology or an equivalent qualification. However, this does not apply to students who registered for the National Diploma for the first time before 2007, and who have not since interrupted their studies.

b. Selection criteria: Admission is subject to selection.

c. Minimum duration: One year.

d. Presentation and campus: Pretoria Campus (block-based classes offered over a period of two years). Please note that the campus indicated is subject to change and confirmation.

e. Intake for the qualification: January and July.

f. Readmission: See Chapter 3 of Students’ Rules and Regulations.

g. Subject credits: Subject credits are shown in brackets after each subject.

FIRST YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>POP410T</td>
<td>Polymer Technology: Practical IV</td>
<td>(0.250)</td>
</tr>
<tr>
<td>PYT400T</td>
<td>Polymer Technology IV</td>
<td>(0.250)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE FIRST YEAR:  0,500

SECOND YEAR

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWP410T</td>
<td>Polymer Science: Practical IV</td>
<td>(0.250)</td>
</tr>
<tr>
<td>PYW400T</td>
<td>Polymer Science IV</td>
<td>(0.250)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE SECOND YEAR:  0,500

TOTAL CREDITS FOR THE QUALIFICATION:  1,000
REMARKS

a. Admission requirement(s): A Baccalaureus Technologiae: Polymer Technology or an equivalent qualification.

Students should preferably have passed the subject, Research Methodology, before registering, but should definitely complete it before their dissertations will be accepted. Students who have not passed Research Methodology should make arrangements with Mrs B van Eeden, tel. 012 841 4926, to pay for and attend classes in this subject.

b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of one year and a maximum of three years.

d. Presentation and campus: Pretoria Campus (research).

Please note that the campus indicated is subject to change and confirmation.

e. Content: This programme comprises a research project with a dissertation, provided the student passes Research Methodology first. In the dissertation, the student must prove that he or she understands a particular problem in the industry in which he or she has done research and is able to analyse it, set it out logically, arrive at logical conclusions or a diagnosis, and make proposals for the solution or elimination of the problem. The dissertation should comply with the usual general technical requirements and rules relating to scope, quality and layout.

f. Subject credits: Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>POY500T</td>
<td>Dissertation: Polymer Technology</td>
<td>(1,000)</td>
</tr>
<tr>
<td>POY500R</td>
<td>Dissertation: Polymer Technology (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

TOTAL CREDITS FOR THE QUALIFICATION: 1,000

REMARKS

a. Admission requirement(s): A Magister Technologiae: Polymer Technology or an equivalent qualification.

b. Selection criteria: All applications are subject to selection.

c. Duration: A minimum of two years and a maximum of five years.

d. Presentation and campus: Pretoria Campus (research).

Please note the campus indicated is subject to change and confirmation.
e. **Content:** This programme comprises an advanced research project with a thesis. In the thesis, the student must provide proof of original, creative thinking and problem-solving skills, and prove that he or she can make a real contribution to the solution of a particular problem in the industry to which the research applies. The thesis should comply with the usual general technical requirements and rules relating to scope, quality and layout.

f. **Subject credits:** Subject credits are shown in brackets after each subject.

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>POY700T</td>
<td>Thesis: Polymer Technology</td>
<td>(2,000)</td>
</tr>
<tr>
<td>POY700R</td>
<td>Thesis: Polymer Technology (re-registration)</td>
<td>(0,000)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE QUALIFICATION: 2,000**

### 8.21 NATIONAL DIPLOMA: THREE-DIMENSIONAL DESIGN
(Field of specialisation: Engineering and Related Design)
Qualification code: NDDI08

**REMARKS**

a. **Admission requirement(s):**
   - For students who obtained a Senior Certificate before 2008: A Senior Certificate or an equivalent qualification, with D symbols at the Higher Grade or C symbols at the Standard Grade for English and Mathematics.
   - For students who have obtained a National Senior Certificate since 2008: A National Senior Certificate or an equivalent qualification, with English (4) and Mathematics or Mathematical Literacy (4).

b. **Recommended subject(s):** None.

c. **Selection criteria:** Admission Point Score (APS) and assessment procedures:

Candidates with an APS score of 24+ will be required to submit a portfolio and will then be invited to attend an interview and practical assessment.

**FOR STUDENTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

<table>
<thead>
<tr>
<th>APS</th>
<th>HG</th>
<th>SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>G</td>
<td>F</td>
</tr>
</tbody>
</table>

Total APS score: 24 (six subjects)
FOR STUDENTS WHO HAVE OBTAINED A NATIONAL SENIOR CERTIFICATE SINCE 2008:

<table>
<thead>
<tr>
<th>SUBJECT REQUIREMENTS</th>
<th>MINIMUM PERFORMANCE LEVEL/SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically required subjects:</td>
<td></td>
</tr>
<tr>
<td>English – home language or first additional language</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics or Mathematical Literacy</td>
<td>4</td>
</tr>
<tr>
<td>Additional subjects:</td>
<td></td>
</tr>
<tr>
<td>Any four other subjects with a final score of 16</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL APS SCORE</strong> (six subjects, excluding Life Orientation)</td>
<td>24</td>
</tr>
</tbody>
</table>

d. Minimum duration: Three years.

e. Presentation and campus: Pretoria Campus (day classes). Please note that the campus indicated is subject to change and confirmation.

f. Intake for the qualification: January and July.

g. Readmission: See Chapter 3 of Students’ Rules and Regulations.

h. Subject credits: Subject credits are shown in brackets after each subject. The total number of credits required for this qualification is 3,000.

**FIRST YEAR**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHE100T</td>
<td>Freehand Drawing</td>
<td>(0,166)</td>
<td></td>
</tr>
<tr>
<td>HAD110T</td>
<td>History of Art and Design</td>
<td>(0,166)</td>
<td></td>
</tr>
<tr>
<td>ITD100T</td>
<td>Industrial Design I</td>
<td>(0,266)</td>
<td></td>
</tr>
<tr>
<td>BMN120D</td>
<td>Business Management I</td>
<td>(0,134)</td>
<td></td>
</tr>
</tbody>
</table>

**FIRST SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGG101T</td>
<td>Engineering Design I</td>
<td>(0,067)</td>
</tr>
<tr>
<td>MDR111T</td>
<td>Mechanical Engineering Drawing</td>
<td>(0,067)</td>
</tr>
</tbody>
</table>

**SECOND SEMESTER**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDD101T</td>
<td>Computer-Aided Design</td>
<td>(0,067)</td>
</tr>
<tr>
<td>MUR101T</td>
<td>Manufacturing I</td>
<td>(0,067)</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS FOR THE FIRST YEAR:** 1,000

**SECOND YEAR**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>CREDIT</th>
<th>PREREQUISITE SUBJECT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOI200T</td>
<td>History of Industrial Design</td>
<td>(0,133)</td>
<td>History of Art and Design</td>
</tr>
<tr>
<td>ITD200T</td>
<td>Industrial Design II</td>
<td>(0,333)</td>
<td>Industrial Design I</td>
</tr>
<tr>
<td>MIY100T</td>
<td>Material Technology I</td>
<td>(0,100)</td>
<td></td>
</tr>
<tr>
<td>PDW210T</td>
<td>Presentation Drawing</td>
<td>(0,166)</td>
<td>Freehand Drawing</td>
</tr>
</tbody>
</table>
FIRST SEMESTER
BMN23AD  Business Management IIA (0,067) Business Management IA
EGG201T  Engineering Design II (0,067) Engineering Design I

SECOND SEMESTER
BMN23BD  Business Management IIB (0,067) Business Management IA
MUR201T  Manufacturing II (0,067) Manufacturing I
TOTAL CREDITS FOR THE SECOND YEAR: 1,000

THIRD YEAR
DTH310T  Design Theory (0,133) History of Industrial Design
ITD300T  Industrial Design III (0,350) Industrial Design II
MIY200T  Material Technology II (0,100) Material Technology I
MUO300T  Multimedia Presentation (0,166) Presentation Drawing

FIRST SEMESTER
BMN33AD  Business Management IIIA (0,067) Business Management IIA
ERG301T  Ergonomics (0,050)

SECOND SEMESTER
BMN33BD  Business Management IIIB (0,067) Business Management IIA
MUR301T  Manufacturing III (0,067) Manufacturing II
TOTAL CREDITS FOR THE THIRD YEAR: 1,000

8.22 SUBJECT INFORMATION
Syllabus content subject to change to accommodate industry changes.

SUBJECT NAME:  APPLIED STRENGTH OF MATERIALS III
SUBJECT CODE:  ASA301T
EVALUATION METHOD:  1 X 3-HOUR PAPER
TOTAL TUITION TIME:  ± 68 hours
OVERVIEW OF SYLLABUS:
Leaf springs. Slope and deflection of beams. Struts, compound stresses and compound strains. Thick cylinders. Practical laboratory work.

SUBJECT NAME:  AUTO-ELECTRICAL ENGINEERING III
SUBJECT CODE:  AEE301T
EVALUATION METHOD:  1 X 3-HOUR PAPER
TOTAL TUITION TIME:  ± 68 hours
OVERVIEW OF SYLLABUS:
This subject deals with all aspects of electricity and electronics in a motor vehicle, including components, their operation, fault finding, control, design etc.

SUBJECT NAME:  AUTOMATIC CONTROL IV
SUBJECT CODE:  ATC411B, ATC411T
EVALUATION METHOD:  1 X 3-HOUR PAPER
TOTAL TUITION TIME:  ± 68 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: BUSINESS MANAGEMENT I
SUBJECT CODE: BMN120D
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: Not available
OVERVIEW OF SYLLABUS: The management of a company consists of a general management task and several functional management tasks, which are linked by the profit motive as the primary objective.

SUBJECT NAME: BUSINESS MANAGEMENT IIA
SUBJECT CODE: BMN23AD
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS: A study of financial management.

SUBJECT NAME: BUSINESS MANAGEMENT IIB
SUBJECT CODE: BMN23BD
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS: A study of operations management.

SUBJECT NAME: BUSINESS MANAGEMENT IIIA
SUBJECT CODE: BMN33AD
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS: Marketing management and general management.

SUBJECT NAME: BUSINESS MANAGEMENT IIIB
SUBJECT CODE: BMN33BD
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS: Purchasing management, personal management and integration of all business management functions.

SUBJECT NAME: CHEMISTRY I
SUBJECT CODE: CHE141B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 160 hours
OVERVIEW OF SYLLABUS: Matter and energy (atomic theory, the periodic table, chemical bonding, chemical compositions and nomenclature), reaction equations and stoichiometry, solutions, acids, bases and salts, chemical equilibrium, electrochemistry and redox theory, descriptive chemistry of selected elements, organic chemistry, chemistry practicals.

SUBJECT NAME: COMMUNICATION SKILLS I
SUBJECT CODE: COS101T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 34 hours

SUBJECT NAME: COMPUTER-AIDED DESIGN
SUBJECT CODE: CDD101T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS: Introduction to computer-aided design and computer-aided draughting, solid modelling of components and assemblies, various software packages, creation of compound drawings.
SUBJECT NAME: COMPUTER-AIDED DRAUGHTING I
SUBJECT CODE: CAI101T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Introduction to computer-aided draughting (CAD), various software packages, compound drawings.

SUBJECT NAME: COMPUTER SKILLS I
SUBJECT CODE: CSK101C
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
Components of a microcomputer system and engineering applications of software. Managing personal computers. The subject covers hardware operating systems (Windows 2000 and MS-DOS), Microsoft Word, Microsoft PowerPoint, Excel, and an introduction to the Internet.

SUBJECT NAME: COMPUTER STUDIES
SUBJECT CODE: CSD201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
The basic principles of computer hardware (A+) and programming. The hardware component teaches how to assemble and commission a PC. The programming component teaches the C++ programming language. The following topics are covered: data types and conversions, program actions and loop control, functions and parameters, data structures, pointers. The subject is practice-orientated and assessment is based on a number of programming tasks completed during the semester.

SUBJECT NAME: CONTROL OF MACHINES
SUBJECT CODE: CNF301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
The use of electropneumatics and electrohydraulics in the control of machines and systems. An introduction to the use of a PLC to control machines and systems, as well as fundamental robot programming.
(Subject taken from Engineering: Mechatronics for Engineering: Mechanical and Engineering: Mechanical: Manufacturing.)

SUBJECT NAME: CONTROL SYSTEMS IV
SUBJECT CODE: CSY401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: DESIGN PROJECT III
SUBJECT CODE: DPJ301T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Design, construction, testing and documentation of a complete project at the appropriate level in the particular discipline.

SUBJECT NAME: DESIGN THEORY
SUBJECT CODE: DTH310T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 160 hours
OVERVIEW OF SYLLABUS:
Students acquire a wide knowledge of industrial design from the earliest cultures through to the industrial revolution and most recent times. They also acquire a design vocabulary and gain insight into socio-economic factors that influence industrial design.
SUBJECT NAME: DIGITAL CONTROL SYSTEMS IV
SUBJECT CODE: DCS401T
EVALUATION METHOD: 1 X 3-HOUR PAPER (OPEN BOOK)
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Discrete-time models and sampled data systems, difference equations, mathematical representation of the sampling process using the Z-transform, analysis of sampled data systems, stability considerations of sampled data systems, design of compensation for sampled data systems using transform techniques.
(Subject taken from Engineering: Electrical.)

SUBJECT NAME: DIGITAL SYSTEMS I
SUBJECT CODE: DSY131T, DSY141T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Basic components of digital circuits, namely NOT, AND and NOR gates. How more complex gates and logic functions can be built from the basic gates. Boolean algebra and Karnaugh maps are used to simplify functions. Combinational logic circuits, including adders, comparators, decoders, encoders, multiplexers, demultiplexers and error control circuits. Binary, octal, decimal and hexadecimal numbers and operations. Basic components of sequential circuits, namely latches and flip-flops. Counters.
(Subject taken from Engineering: Electrical.)

SUBJECT NAME: DIGITAL SYSTEMS II
SUBJECT CODE: DSY231T, DSY241T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
How more complex memory components, such as counters and registers, can be built from the basic components. Different analogue-to-digital and digital-to-analogue converters. Introduction to microprocessor systems and programmable interface control devices (PiCs). TTL and CMOS-integrated circuit technologies and electronic display units. Introduction to programmable logic devices (PLD, EPLD, FPGA).
(Subject taken from Engineering: Electrical.)

SUBJECT NAME: DIGITAL SYSTEMS III
SUBJECT CODE: DSY351T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Concentrates on computer memory and micro-controllers. Static and dynamic characteristics of read-write memories (SRAM, DRAM), structure and applications are dealt with. Read-only memories are also covered (ROM, EPROM, FLASH). Micro-controller architecture is subsequently dealt with; the design and implementation of applications with flow-charts and assembler language form an important component of the subject.
(Subject taken from Engineering: Electrical.)

SUBJECT NAME: DIGITAL TECHNOLOGY I
SUBJECT CODE: DIT111T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 240 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to digital systems. Basic principles of digital systems in respect of basic digital components in the use of digital circuits such as logic gates. Basic system analysis and application.
SUBJECT NAME: DIGITAL TECHNOLOGY I
SUBJECT CODE: DIT101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
Basic components of digital circuits, namely NOT, AND and NOR gates. It is subsequently shown how more complex gates and logic functions can be built from the basic gates. Boolean algebra and Karnaugh maps are used to simplify functions. Combinational logic circuits, including adders, comparators, decoders, encoders, multiplexers, demultiplexers and error control circuits are covered. Binary, octal, decimal and hexadecimal numbers and operations are also included.

SUBJECT NAME: DIGITAL TECHNOLOGY II
SUBJECT CODE: DIT211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 240 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive introduction to basic programming principles. Basic principles of digital systems in the use of digital circuits such as converters, memory devices, registers and counters. Basic system analysis and application.

SUBJECT NAME: DIGITAL TECHNOLOGY II
SUBJECT CODE: DIT201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
Basic components of sequential circuits, namely latches and flip-flops. It is subsequently shown how more complex memory components, such as counters and registers, can be built from the basic components. Different analogue-to-digital and digital-to-analogue converters are covered, and during the introduction to microprocessor systems, the programmable interface control devices (PiCs) are presented. TTL and CMOS-integrated circuit technologies and electronic display units are included. The subject ends with the introduction of programmable logic devices (PLD, EPLD, FPGA).

SUBJECT NAME: DRAWING: CHEMICAL ENGINEERING I
SUBJECT CODE: DCE111T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Students are taught basic drawing skills to enable them to express their ideas and to read working drawings of, for example, moulds or dyes (colouring). Students are also introduced to computer-aided drawing (CAD) techniques.

SUBJECT NAME: ELECTRIC MACHINES
SUBJECT CODE: EIE301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
A variety of electrical motors and generators are used on a large scale in the industry. This subject serves as an introduction to electrical machines and provides exposure to the principles on which such machines operate. Single-phase transformers, induction machines and direct-current machines are discussed in this subject.
(Subject taken from Engineering: Mechatronics for Engineering: Mechanical.)

SUBJECT NAME: ELECTRICAL DISTRIBUTION III
SUBJECT CODE: ELD331T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
The principles and operation of different types of power stations and substations. High-voltage transmission lines, switchgear, cables, isolators, line supports, feeders and busbars.
SUBJECT NAME: ELECTRICAL ENGINEERING I
SUBJECT CODE: EEN111T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
The correct use of SI units and their applications, the construction and maintenance of batteries, a network analysis on direct current circuits and AC theory, a study of various measuring instruments. An investigation of the effects of magnetic lines of force, the application and use of magnetic fields, inductance and the factors affecting it, capacitors and their operation.

SUBJECT NAME: ELECTRICAL ENGINEERING II
SUBJECT CODE: EEN211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
The analysis of networks through different methods, the effect of harmonics, three-phase systems, power-factor correction, the operation of motors and transformers.

SUBJECT NAME: ELECTRICAL ENGINEERING III
SUBJECT CODE: EEN311T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: ELECTRICAL MACHINES II
SUBJECT CODE: EMA241T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
A variety of electrical motors and generators are used on a large scale in the industry. This subject serves as an introduction to electrical machines and provides insight into the principles on which such machines operate. Single-phase transformers, induction machines and direct current machines are covered.
(Subject taken from Engineering: Electrical.)

SUBJECT NAME: ELECTRICAL MACHINES III
SUBJECT CODE: EMA341B, EMA341T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
The generation of electricity and the application of electrical machines in traction, the mining industry and other industries form the basis of this subject. Synchronous generators and motors, three-phase transformers and induction motors are covered.
(Subject taken from Engineering: Electrical.)

SUBJECT NAME: ELECTRICAL MACHINES IV
SUBJECT CODE: EMA411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
A further study of design and maintenance of synchronous, induction and special machines, as well as the different control techniques and uses of those machines.
SUBJECT NAME: ELECTRICAL PROTECTION IV
SUBJECT CODE: EPC401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 70 hours
OVERVIEW OF SYLLABUS:
This subject contains a high component of theoretical knowledge and calculations, as well as tasks and practicals on inrush currents, protections on different types of transformer feeders, motors, generators and feeders, busbar (busbar zone protection) distance and cable differential protection.

SUBJECT NAME: ELECTRONIC TECHNOLOGY
SUBJECT CODE: ENY101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
The basic principles of electronics: the use of measuring instruments, semiconductor theory, the P-N junction, diodes and rectification, simple power supplies, the bipolar junction transistor, the field effect transistor and operational amplifiers. On completion of this subject, the student should be able to do circuit analysis and design in respect of simple power supplies without smoothing, the direct-current operation of single-stage transistor amplifiers and simple operational amplifier functions. Theoretical presentation is supported by practical experiments in a laboratory, which are taken into account during evaluation.
(Subject taken from Engineering: Mechatronics for Engineering: Mechanical.)

SUBJECT NAME: ELECTRONICS I
SUBJECT CODE: ELC111T, ELC121T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
The basic principles of electronics: the use of measuring instruments, semiconductor theory, the P-N junction, diodes and rectification, simple power supplies, the bipolar junction transistor, the field effect transistor and operational amplifiers. On completion of this subject, students should be able to do circuit analysis and design in respect of simple power supplies without smoothing, the direct-current operation of single-stage transistor amplifiers and simple operational amplifier functions. Theoretical presentation is supported by practical experiments in a laboratory, which are taken into account during evaluation.
(Subject taken from Engineering: Electrical.)

SUBJECT NAME: ELECTRONICS II
SUBJECT CODE: ELC211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
The basic concepts and operation of basic rectification, voltage regulation, single-stage transistor amplifiers, transistor configurations, field-effect transistors, characteristics, types, operational amplifiers, basic configurations, special semiconductors, multi-layer semiconductors, optoelectronics. On completion of this subject, students should be able to do basic design in respect of simple power supplies without smoothing, the direct-current operation of single-stage transistor amplifiers and simple operational amplifier functions. Theoretical presentation is supported by practical experiments in the laboratory, which are taken into account during evaluation.
(Subject taken from Engineering: Electrical.)

SUBJECT NAME: ELECTROTECHNOLOGY I
SUBJECT CODE: ETT111T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 136 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to electrical engineering. Basic principles of electrical engineering in respect of measurements and different units. Application of basic components such as resistance, capacitance and inductance.
SUBJECT NAME: ELECTROTECHNOLOGY I
SUBJECT CODE: ETT101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
The correct use of S1 units and their applications, the construction and maintenance of batteries, a network analysis on direct current circuits and AC theory, a study of various measuring instruments. The effects of magnetic lines of force, the application and use of magnetic fields, inductance and the factors affecting it, capacitors and their operation.

SUBJECT NAME: ELECTROTECHNOLOGY II
SUBJECT CODE: ETT211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Students acquire sound knowledge of systems, machines and equipment used in the field of electrical engineering for the conversion of energy, which mechanical engineers may encounter during their careers. In practical work, students learn to handle and connect equipment. Presentation, alternating current circuit theory, electrical measurements, direct-current machines and single-phase transformers are also dealt with.

SUBJECT NAME: ENGINEERING COMMUNICATION
SUBJECT CODE: EGN101B
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Basics of technical English, verbal communication ethics, technical report writing, general business documents, presentation skills, meetings and interpersonal skills.

SUBJECT NAME: ENGINEERING COMMUNICATION I
SUBJECT CODE: EGN111T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Specific discipline-related interpretation, presentation and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. The students will be introduced to aspects of scaffolded reading as a tool to acquiring knowledge and interpretative abilities within their subject disciplines.

SUBJECT NAME: ENGINEERING DESIGN I
SUBJECT CODE: EGG101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
Students learn about mechanical engineering elements and how to apply them in design projects. Permanent and non-permanent fasteners, mechanical springs, bearings, gears, fits and tolerances.

SUBJECT NAME: ENGINEERING DESIGN II
SUBJECT CODE: EGG201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
Students learn about mechanical engineering elements and how to apply them in design projects. Clutches, brakes, couplings, flywheels, flexible mechanical elements, shafts and axles.
SUBJECT NAME: ENGINEERING DESIGN PROJECT IV
SUBJECT CODE: EDP400T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Engineering management, project management, human resource management, law of contract, accounting and financial management, budgeting and the completion of an industrial project.

SUBJECT NAME: ENGINEERING MANAGEMENT IV
SUBJECT CODE: EGM411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Management practice and personnel, financial, production, project, marketing and research and development management. Negotiating techniques.

SUBJECT NAME: ENGINEERING MATHEMATICS IV
SUBJECT CODE: EMT451T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Advanced mathematical concepts are used in complex analysis and transforms. On completion of this subject, students should know and understand the following concepts and apply them to solve problems: complex variables, mappings, analytical functions, complex integration, Laplace transforms, Z-transforms, Fourier transforms, partial differential equations.

SUBJECT NAME: ERGONOMICS
SUBJECT CODE: ERG301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
The study of the human-machine interface.

SUBJECT NAME: EXPERIENTIAL LEARNING I
SUBJECT CODE: EXP1EME, EXP1MRF
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
Industry-related training, as determined by the industry and the University.

SUBJECT NAME: EXPERIENTIAL LEARNING I
SUBJECT CODE: EXP1ENM
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
Industry-related training, as determined by the industry and the University.

SUBJECT NAME: EXPERIENTIAL LEARNING II
SUBJECT CODE: EXP2EME, EXP2MRF
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
Industry-related training, as determined by the industry and the University.

SUBJECT NAME: EXPERIENTIAL LEARNING II
SUBJECT CODE: EXP2ENM
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
Industry-related training, as determined by the industry and the University.
SUBJECT NAME: FLUID CONTROL SYSTEMS III
SUBJECT CODE: FCS301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
The use of electropneumatics and electrohydraulics in the control of machines and systems. An introduction to the use of a PLC to control machines and systems, as well as fundamental robot programming.

SUBJECT NAME: FLUID MECHANICS II
SUBJECT CODE: FMS211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FLUID MECHANICS III
SUBJECT CODE: FMS331T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to fluid mechanics. Basic principles of fluid mechanics in respect of measurements and different units, concentrating on a more in-depth study of the applications of pressure in a fluid system. Explanation and working of pressure gauge.

SUBJECT NAME: FLUID MECHANICS IV
SUBJECT CODE: FMS411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION ACADEMIC SKILLS
SUBJECT CODE: FPACA01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
• The important aspects of life skills: Campus ethics, learning styles and whole-brain thinking, self-image and assertive behaviour, time management, self-motivation, conflict management, sexuality and relationships, problem-solving skills, managing stress, multicultural society, techniques for summarising and memorising, how to cope with assessments and assignments, creativity, and many more. The life-skills sessions are participative, with group discussions and personal application to optimise the student's learning experience.
• The important aspects of English communication: Interpret, relate and reflect on all available and relevant resource material in proper English. Communicate orally in a comprehensible and clear manner in both general and subject-specific communication. Demonstrate intermediate-level proficiency in written English.
• An element of Computer Literacy is woven throughout the presentation of this subject as well as the Mathematics course. Students will be introduced to the basic functions of personal computing, Windows, word processors and other software, and engage in e-learning as a way of becoming familiar with this kind of technology.
SUBJECT NAME: FOUNDATION APPLIED SCIENCE
SUBJECT CODE: FPAPP01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours

OVERVIEW OF SYLLABUS:
An introduction to physics, statics, dynamics and electricity, dealing with the following topics: Atom theory, electricity, magnetism and electromagnetism, inductors, capacitors, RLC networks. Basic concepts of atomic bonds, crystal structures and material properties. Control over properties by heat treatment, microstructure and phase diagrams. Measuring material properties with mechanical tests like tensile tests, hardness tests, impact tests, etc. General forming processes, plastic strain, strain hardening, hot working, cold working, recrystallisation. Properties and uses of the well-known non-ferrous alloys. The basic properties and behaviour of ceramics, polymers and compound materials. Measurements, mechanics, motion in one-dimension kinematics, laws of motion dynamics, kinetic theory of matter and properties of matter, introduction to the biological sciences, general laws of movement, mechanics, heat, hydrodynamics, electricity and magnetism, wave motion, and nuclear physics.

SUBJECT NAME: FOUNDATION COMPUTER-AIDED DRAUGHTING I
SUBJECT CODE: FPCAI01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 136 hours

OVERVIEW OF SYLLABUS:
Students will be introduced to: operating systems (Windows environment), basic word-processing skills (MS-Word), spreadsheets (MS-Excel), presentations tools (PowerPoint), communications, connectivity, the internet and the Web, computer-aided draughting (CAD), various software packages and compound drawings.

SUBJECT NAME: FOUNDATION ENGINEERING
SUBJECT CODE: FPEGI01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours

OVERVIEW OF SYLLABUS:
An introduction to technical drawing as well as the type of skills, workplace environments and knowledge required in all the major fields of engineering that are practised in the South African economy.

SUBJECT NAME: FOUNDATION ENGINEERING COMMUNICATION
SUBJECT CODE: FPEGN02
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 136 hours

OVERVIEW OF SYLLABUS:
Speaking and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. These skills are acquired in an e-learning environment which would also include the following topics:
• Operating systems (Windows environment)
• Basic word-processing skills (MS-Word)
• Spreadsheets (MS-Excel)
• Presentations tools (PowerPoint)
• Communications, connectivity, the internet and the Web

Students will be assessed on their language, presentation and report-writing skills. Basics of technical English, verbal communication ethics, technical report writing, general business documents, presentation skills, meetings and interpersonal skills.

SUBJECT NAME: FOUNDATION ENGINEERING COMMUNICATION I
SUBJECT CODE: FPEGN01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours

OVERVIEW OF SYLLABUS:
Speaking and communication skills, listening skills, reading for academic understanding, academic vocabulary, learning strategies and information gathering, writing, business and life skills. Communication theory. Verbal communication. Technical writing skills. Group communication skills. Applied technical writing skills. Interpersonal skills.
SUBJECT NAME: FOUNDATION ELECTROTECHNOLOGY I
SUBJECT CODE: FPETT01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 136 hours
OVERVIEW OF SYLLABUS:
Atom theory, electricity, magnetism and electromagnetism, inductors, capacitors and RLC networks. The correct use of S1 units and their applications, the construction and maintenance of batteries, a network analysis on direct current circuits and AC theory, a study of various measuring instruments. The effects of magnetic lines of force, the application and use of magnetic fields, inductance and the factors affecting it, capacitors and their operation. The correct use of S1 units and their applications, the construction and maintenance of batteries, a network analysis on direct current circuits and AC theory, a study of various measuring instruments. The effects of magnetic lines of force, the application and use of magnetic fields, inductance and the factors affecting it, capacitors and their operation.

SUBJECT NAME: FOUNDATION MANUFACTURING ENGINEERING
SUBJECT CODE: FPMFE01
EVALUATION METHOD: 1 X 3-HOUR PAPER AND PRACTICAL
TOTAL TUITION TIME: ± 360 hours
OVERVIEW OF SYLLABUS:
Introduction to engineering (chemical, metallurgical, civil, surveying, electrical, clinical, digital technology, high-frequency technology, power engineering, process instrumentation, mechanical, industrial, mechatronics), factory safety, measurements, engineering materials, projects. Safety and safety legislation, identification and application of various types of steel, measuring equipment, measuring and comparators, hand and machine tools, metal cutting and machining, CNC machining, industrial robots, welding, sheet metal work, with a significant component of practical work.

SUBJECT NAME: FOUNDATION MATHEMATICS
SUBJECT CODE: FPMAT05
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
Basic algebra, functions, exponents and logarithm, differential calculus, trigonometry, geometry. Basic mathematics. Differentiation. Integration. Matrices and determinants. Vectors. Data handling. Complex numbers or mensuration. Students will be introduced to personal computers, Windows and e-learning technologies as a fundamental part of this subject.

SUBJECT NAME: FOUNDATION MATHEMATICS I
SUBJECT CODE: FPMAT04
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 136 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION MECHANICAL ENGINEERING DRAWING
SUBJECT CODE: FPMDR02
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 240 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: FOUNDATION MECHANICAL ENGINEERING DRAWING I
SUBJECT CODE: FPMDR01
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 136 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION MECHANICAL MANUFACTURING ENGINEERING I
SUBJECT CODE: FPMME01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 136 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FOUNDATION MECHANICS I
SUBJECT CODE: FPMHC01
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 240 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: FREEHAND DRAWING
SUBJECT CODE: FHE100T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 200 hours
OVERVIEW OF SYLLABUS:
Students should demonstrate an appropriate level of competence in the following drawing-related areas: a perceptual and conceptual based analysis of man-made and natural objects, the appropriate use of drawing materials, and the selection and use of the visual elements and principles.

SUBJECT NAME: HISTORY OF ART AND DESIGN
SUBJECT CODE: HAD110T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 200 hours
OVERVIEW OF SYLLABUS:
A general outline of the history of art and design from the beginning of recorded history to the present day to indicate broad developmental patterns.
SUBJECT NAME: HISTORY OF INDUSTRIAL DESIGN
SUBJECT CODE: HOI200T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 160 hours
OVERVIEW OF SYLLABUS:
A general outline of the history of industrial design through the industrial revolution and modern art movements.

SUBJECT NAME: HYDRAULIC MACHINES III
SUBJECT CODE: HYM301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: INDUSTRIAL DESIGN I
SUBJECT CODE: ITD100T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 320 hours
OVERVIEW OF SYLLABUS:
The purpose of this course is to equip the student with a fundamental understanding of the design process and how to apply this process to a design problem. The design process is divided into logical phases that are used to process an idea to a real product ready for production.

SUBJECT NAME: INDUSTRIAL DESIGN II
SUBJECT CODE: ITD200T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 400 hours
OVERVIEW OF SYLLABUS:
The student is required to apply the design process to more complex design problems that consider a broad array of constraints. The student should solve design problems and be able to demonstrate his or her solutions in functional prototypes.

SUBJECT NAME: INDUSTRIAL DESIGN III
SUBJECT CODE: ITD300T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 420 hours
OVERVIEW OF SYLLABUS:
The student is required to apply the design process to real-world design problems and provide design solutions that are feasible for mass production, distribution, marketing and sales to their intended target markets.

SUBJECT NAME: INDUSTRIAL PROJECT IV
SUBJECT CODE: IPR410T
EVALUATION METHOD: PROJECT
TOTAL TUITION TIME: 12 months
OVERVIEW OF SYLLABUS:
The industrial project is continued throughout the study period for at least 300 hours. The subject content is handled on a personal basis and is evaluated by a panel of experts. The work may be done in the University environment or in the industry itself. Assessment of the project is based on a written report and its oral presentation before a panel of experts.

SUBJECT NAME: MACHINE TOOL THEORY IV
SUBJECT CODE: MGY401T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: MANUFACTURING I
SUBJECT CODE: MUR101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
The purpose of this subject is to equip the student with a fundamental understanding of basic material handling, fabrication and manufacturing techniques, as well as relevant safety practices.

SUBJECT NAME: MANUFACTURING II
SUBJECT CODE: MUR201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
The students should demonstrate an understanding and knowledge of various manufacturing processes, theories and applications. This should include an understanding of various surface treatments, cleaning methodologies, measurement and metrology to determine manufactured products' conformity to specifications.

SUBJECT NAME: MANUFACTURING III
SUBJECT CODE: MUR301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
The students should demonstrate an understanding and knowledge of automated manufacturing systems and their economic impact within the context of product design. Students should also be able to identify and describe various types of production, associated layouts and analysis pertaining to different production concepts.

SUBJECT NAME: MANUFACTURING ENGINEERING
SUBJECT CODE: MFE101C
EVALUATION METHOD: 1 X 3-HOUR PAPER AND PRACTICAL
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
Safety and safety legislation, identification and application of various types of steel, measuring equipment, measuring and comparators, hand and machine tools, metal cutting and machining, CNC machining, industrial robots, welding, sheet metal work, with a significant component of practical work.

SUBJECT NAME: MANUFACTURING ENGINEERING IV
SUBJECT CODE: MFE401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
The management of computer-integrated manufacturing (CIM) systems will be dealt with in two sections:
• Computer-aided engineering (CAE), which covers quality, process and capacity planning and costs.
• Computer-aided manufacturing (CAM), which covers aspects such as automation and implementation. Individual aspects of CIM, such as robotics, flexible assembly systems (FAS) and flexible Manufacturing systems (FMS), will be covered in project work.

SUBJECT NAME: MANUFACTURING MANAGEMENT IV
SUBJECT CODE: MFG401T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
The management of computer-integrated manufacturing (CIM) systems will be dealt with in two sections:
• Computer-aided engineering (CAE), which covers quality, process and capacity planning and costs.
• Computer-aided manufacturing (CAM), which covers such aspects as automation and implementation. Individual aspects of CIM, such as robotics, flexible assembly systems (FAS) and flexible manufacturing systems (FMS), will be covered in project work.
SUBJECT NAME: MATERIAL TECHNOLOGY I
SUBJECT CODE: MIY100T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
The students should demonstrate a basic understanding and knowledge of polymer technology and its impact on product design. Students should be able to specify basic materials and select the most appropriate production methods for a specified product.

SUBJECT NAME: MATERIAL TECHNOLOGY II
SUBJECT CODE: MIY200T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
The students should demonstrate a broad understanding and knowledge of polymer design strategies. Students should be able to analyse the performance requirements of products and be capable of providing feasible production strategies that include material selection, production and assembly methods, with an appreciation of constraints such as economic viability and projected production volumes.

SUBJECT NAME: MATERIALS AND PROCESSING
SUBJECT CODE: MSS101T
EVALUATION METHOD: 1 X 3-HOUR PAPER AND PRACTICAL
TOTAL TUITION TIME: ±120 hours
OVERVIEW OF SYLLABUS:
A study of the properties and applications of non-ferrous metals, polymers, composites, an overview of processing techniques and machinery, such as laser cutting and welding, spark erosion, plasma cutting, water jet cutting, plastic welding, composite product development, polymer product development, injection moulding and rapid proto-typing with a significant practical component.

SUBJECT NAME: MATHEMATICS I
SUBJECT CODE: MAT171T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MATHEMATICS I
SUBJECT CODE: MAT181T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 180 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive introduction to the theorems and applications of the differential calculus, trigonometry, algebra and matrices. Elementary data handling and vector calculations are also introduced with practical introductions to the applications specific to the engineering discipline in which the student is registered.

SUBJECT NAME: MATHEMATICS II
SUBJECT CODE: MAT271T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME:  MATHEMATICS II
SUBJECT CODE:  MAT281T
EVALUATION METHOD:  1 X 3-HOUR PAPER
TOTAL TUITION TIME:  ± 180 hours
OVERVIEW OF SYLLABUS:
A more in-depth study of the applications of differential and integral calculus in the engineering field, with use of technology and software to solve discipline specific problems. A more advanced treatment of matrix calculations and their applications will also be covered.

SUBJECT NAME:  MATHEMATICS III
SUBJECT CODE:  MAT351T
EVALUATION METHOD:  1 X 3-HOUR PAPER
TOTAL TUITION TIME:  ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME:  MECHANICAL ENGINEERING DESIGN
SUBJECT CODE:  MED101T
EVALUATION METHOD:  1 X 3-HOUR PAPER (PRESCRIBED OPEN BOOK)
TOTAL TUITION TIME:  ± 120 hours
OVERVIEW OF SYLLABUS:
General introduction to design. Basic principles of design in respect of knuckle, coffered, rivetted and lozenge joints, thin cylinders, gears, shafts, keys, arms for gears, bearings, shaft couplings, pipes and pipe joints, eccentric loading of connections, welding. Drawing projects.

SUBJECT NAME:  MECHANICAL ENGINEERING DESIGN II
SUBJECT CODE:  MED211T
EVALUATION METHOD:  1 X 3-HOUR PAPER (PRESCRIBED OPEN BOOK)
TOTAL TUITION TIME:  ± 136 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to design. Basic principles of design in respect of measurements and different units, concentrating on a more in-depth study of the identification and measuring of parts in a mechanical system.

SUBJECT NAME:  MECHANICAL ENGINEERING DESIGN II
SUBJECT CODE:  MED201T
EVALUATION METHOD:  1 X 3-HOUR PAPER (PRESCRIBED OPEN BOOK)
TOTAL TUITION TIME:  ± 68 hours
OVERVIEW OF SYLLABUS:
General introduction to design. Basic principles of design in respect of knuckle, coffered, rivetted and lozenge joints, thin cylinders, gears, shafts, keys, arms for gears, bearings, shaft couplings, pipes and pipe joints, eccentric loading of connections, welding. Drawing projects.

SUBJECT NAME:  MECHANICAL ENGINEERING DESIGN III
SUBJECT CODE:  MED321T
EVALUATION METHOD:  1 X 3-HOUR PAPER (PRESCRIBED OPEN BOOK)
TOTAL TUITION TIME:  ± 68 hours
OVERVIEW OF SYLLABUS:
Theory: design and applications of flat-belt drives, V-belt drives, advanced tooth gearing, shafts, single-plate, multi-plate, conical and centrifugal clutches, band and block brakes, members that fail by buckling, thick cylinders, bearings and lubrication, steel ropes, helical springs, piping - fittings and valves, stays for tanks and containers. Drawing: construction of helical springs, gear teeth and helical profile of square screw thread. Conventional representation of items. Assembly drawings of designed projects.
SUBJECT NAME: MECHANICAL ENGINEERING DRAWING
SUBJECT CODE: MDR111T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICAL ENGINEERING DRAWING I
SUBJECT CODE: MDR101T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICAL MANUFACTURING ENGINEERING I
SUBJECT CODE: MME101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICAL MANUFACTURING ENGINEERING II
SUBJECT CODE: MME201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICAL MANUFACTURING ENGINEERING III
SUBJECT CODE: MME301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICAL MANUFACTURING MANAGEMENT III
SUBJECT CODE: MMU301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: MECHANICS I
SUBJECT CODE: MHC121T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 240 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to mechanics. Basic principles of mechanics in respect of measurements and different units. Applications of basic moments, vehicle dynamics and use of decimal figures.

SUBJECT NAME: MECHANICS I
SUBJECT CODE: MHC101C
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICS I
SUBJECT CODE: MHC101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICS II
SUBJECT CODE: MHC201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICS III
SUBJECT CODE: MHC301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICS OF MACHINES II
SUBJECT CODE: MMH221T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 136 hours
OVERVIEW OF SYLLABUS:
An in-depth study of the applications of moment of inertia, simple trusses and method of joints, centre of gravity and centroids of different body’s.

SUBJECT NAME: MECHANICS OF MACHINES II
SUBJECT CODE: MMH211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: MECHANICS OF MACHINES III
SUBJECT CODE: MMH331T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHANICS OF MACHINES IV
SUBJECT CODE: MMH411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: MECHATRONIC ENGINEERING DESIGN
SUBJECT CODE: MCD301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
Theory: design of machines and systems, including the design and/or selection of appropriate automation components such as sensors, actuators and controller. The mechanical components include structural design, as well as belt drives, chain drives, gears, clutches, brakes, bearings and lubrication, steel ropes, springs, piping, fittings and valves. Conventional representation of items. Assembly drawings of designed projects. The sensors, actuators and controller(s) need to be incorporated and included in the design of machines and/or systems.

SUBJECT NAME: MECHATRONIC ENGINEERING PRACTICE (EXPERIENTIAL LEARNING)
SUBJECT CODE: EXP1MEC
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 420 hours
OVERVIEW OF SYLLABUS:
Industry-related training, as determined and agreed on by training providers in industry and the University. The training should be at technician level, and involve the application of knowledge and skills obtained during the academic studies. Typical topics are investigation, analysis, problem-solving, design and development, commissioning, improvement, optimisation, quality control, etc.

SUBJECT NAME: MOTOR VEHICLE ENGINEERING I
SUBJECT CODE: MVE111T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Chassis, clutch, gearbox, propeller/drive shafts, final drive suspension, road wheels and tyres, steering, brakes, cycle of operation, main engine components, fuel systems (diesel and petrol engines), cooling systems, ignition systems.

SUBJECT NAME: MOTOR VEHICLE ENGINEERING II
SUBJECT CODE: MVE211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
A study of engine technology, steering, braking and suspension systems and vehicle electrical systems.
SUBJECT NAME: MULTIMEDIA PRESENTATION
SUBJECT CODE: MUO300T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 200 hours
OVERVIEW OF SYLLABUS:
By the end of this course, the student should have developed a competent set of multimedia presentation skills and be capable of producing realistic product renderings and animation using various electronic media software.

SUBJECT NAME: NETWORKS AND COMMUNICATION
SUBJECT CODE: NUA301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:
An overview of networking and communication in the mechatronic environment, including fundamentals and applications of Bus systems such as R485, Ethernet, Profi-bus and ASI-net, as well as an introduction to the MCS 51 microcontroller, voice recognition, vision systems and GSM.

SUBJECT NAME: ORGANIC CHEMISTRY II
SUBJECT CODE: OCH221T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 90 hours
OVERVIEW OF SYLLABUS:
Aliphatic hydrocarbons, benzene, alkyl and aryl halides, alkanols and alkoxyalkanes, phenols, alkanals and alkanones, carboxylic acids and derivatives, amines. Practical organic chemistry.

SUBJECT NAME: PHYSICS IA
SUBJECT CODE: PHU161B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 130 hours
OVERVIEW OF SYLLABUS:
Remedial mathematics, basic units, vectors and scalars, kinetics, mechanics, momentum, moments, work, energy and power, pressure, density, heat, optics, waves and sound, current electricity, magnetism, radio-activity. Practical physics.

SUBJECT NAME: PLASTICS MATERIAL SCIENCE II
SUBJECT CODE: PME201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 84 hours
OVERVIEW OF SYLLABUS:
The basic principles of polymer physics. Emphasis is placed on flow and other physical properties, as well as interactions with, for instance, additives.

SUBJECT NAME: PLASTICS MATERIAL SCIENCE III
SUBJECT CODE: PME301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 75 hours
OVERVIEW OF SYLLABUS:
A more advanced overview of polymer physics. The effect of structures or additives on secondary bonds. Electrical properties of polymers. The design of parameters for the use of polymers in specific applications.

SUBJECT NAME: PLASTICS MATERIAL SCIENCE: PRACTICAL II
SUBJECT CODE: PMP201T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
The theoretical principles. Correctly designed practicals that reflect the knowledge gained in the relevant theoretical subject (physical testing methods for polymer assessment).
SUBJECT NAME: PLASTICS MATERIAL SCIENCE: PRACTICAL III
SUBJECT CODE: PMP301T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 60 hours
OVERVIEW OF SYLLABUS:
Practical tests and testing techniques relating to the theoretical studies. In addition, students undertake a practical project in the form of a mini-script that encompasses both material science and plastics technology.

SUBJECT NAME: POLYMER CHEMISTRY III
SUBJECT CODE: PYC301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 75 hours
OVERVIEW OF SYLLABUS:
Advanced polymerisation techniques, characterisation, structure and properties, properties of commercial polymers.

SUBJECT NAME: POLYMER CHEMISTRY: PRACTICAL III
SUBJECT CODE: PCP301T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 64 hours
OVERVIEW OF SYLLABUS:
Polymerisation reactions are carried out, and the reactions are controlled by means of sophisticated analytical techniques.

SUBJECT NAME: POLYMER PRODUCTION PRACTICE I
SUBJECT CODE: PYR101T
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
In this six-month period of experiential learning in the industry, students are expected to apply their theoretical training in the work situation. This training is closely monitored by the lecturer concerned.

SUBJECT NAME: POLYMER PRODUCTION PRACTICE II
SUBJECT CODE: PYR201T
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
In this six-month period of experiential learning in the industry, students are expected to apply their theoretical training in the work situation. This training is closely monitored by the lecturer concerned.

SUBJECT NAME: POLYMER PRODUCTION PRACTICE III
SUBJECT CODE: PYR301T
EVALUATION METHOD: EXPERIENTIAL LEARNING
TOTAL TUITION TIME: 6 months
OVERVIEW OF SYLLABUS:
In this six-month period of experiential learning in the industry, students are expected to apply their theoretical training in the work situation. This training is closely monitored by the lecturer concerned.

SUBJECT NAME: POLYMER SCIENCE IV
SUBJECT CODE: PYW400T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
There are two components, namely Polymer Chemistry and Polymer Physics. Polymer Chemistry examines the bond between the chain structure, morphology, microstructure and the solvability and molecular mass. Speciality polymer, cross-bonding reactions and the mechanism of degradation and protection against degradation are also examined.
<table>
<thead>
<tr>
<th>Subject Name</th>
<th>Subject Code</th>
<th>Evaluation Method</th>
<th>Total Tuition Time</th>
<th>Overview of Syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLYMER SCIENCE: PRACTICAL IV</td>
<td>PWP410T</td>
<td>CONTINUOUS ASSESSMENT</td>
<td>± 80 hours</td>
<td>Practicals relating to Polymer Science IV.</td>
</tr>
<tr>
<td>POLYMER TECHNOLOGY I</td>
<td>PTL111T</td>
<td>1 X 3-HOUR PAPER</td>
<td>± 84 hours</td>
<td>Students acquire a thorough basic knowledge of materials. An overview is also given of the processes used in the plastics conversion industry.</td>
</tr>
<tr>
<td>POLYMER TECHNOLOGY II</td>
<td>PTL211T</td>
<td>1 X 3-HOUR PAPER</td>
<td>± 84 hours</td>
<td>The operating and design principles of the processes relating to the screw pump, injection moulding, profile extrusion blow moulding and injection blow moulding. Emphasis is placed on the interrelationship between the process and the material to be converted.</td>
</tr>
<tr>
<td>POLYMER TECHNOLOGY III</td>
<td>PTL311T</td>
<td>1 X 3-HOUR PAPER</td>
<td>± 84 hours</td>
<td>The emphasis is placed on tool and die design. All the other conversion techniques not yet covered are also studied.</td>
</tr>
<tr>
<td>POLYMER TECHNOLOGY IV</td>
<td>PYT400T</td>
<td>CONTINUOUS ASSESSMENT</td>
<td>± 80 hours</td>
<td>This subject comprises compulsory, as well as free-choice, subject matter. Compulsory subject matter includes the selection of polymers and mix design, chemical technology of fluid systems, cellular polymers, polymer films, textiles, polymer morphology, polymer structural analysis.</td>
</tr>
<tr>
<td>POLYMER TECHNOLOGY: PRACTICAL I</td>
<td>PTP111T</td>
<td>CONTINUOUS ASSESSMENT</td>
<td>± 80 hours</td>
<td>Practicals relating to library and computer skills, compression moulding and general thermoset moulding techniques.</td>
</tr>
<tr>
<td>POLYMER TECHNOLOGY: PRACTICAL II</td>
<td>PTP211T</td>
<td>CONTINUOUS ASSESSMENT</td>
<td>± 90 hours</td>
<td>Practical applications of plastics technology theory.</td>
</tr>
<tr>
<td>POLYMER TECHNOLOGY: PRACTICAL III</td>
<td>PTP311T</td>
<td>CONTINUOUS ASSESSMENT</td>
<td>± 90 hours</td>
<td>Students are expected to apply theory to a project which encompasses one or more of the manufacturing techniques, and which links the properties to the theory, as studied in Material Science.</td>
</tr>
</tbody>
</table>
SUBJECT NAME: POLYMER TECHNOLOGY: PRACTICAL IV
SUBJECT CODE: POP410T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 80 hours
OVERVIEW OF SYLLABUS:
Practicals relating to Polymer Technology IV.

SUBJECT NAME: POWER ELECTRONICS III
SUBJECT CODE: PWE311T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Application of thyristors to deal with the following: controlled rectifiers, AC voltage controllers, DC choppers and controlled inverters. Principles of switching and component design. (Subject taken from Engineering: Electrical.)

SUBJECT NAME: POWER ELECTRONICS IV
SUBJECT CODE: PWE411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Theory: in-depth study of semi-conductor devices, resonant converters, power supplies, AC and DC drive control principles, control and feedback model design.

SUBJECT NAME: POWER SYSTEMS IV
SUBJECT CODE: PWS401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: PRESENTATION DRAWING
SUBJECT CODE: PDW210T
EVALUATION METHOD: CONTINUOUS ASSESSMENT
TOTAL TUITION TIME: ± 200 hours
OVERVIEW OF SYLLABUS:
By the end of this course, the student should have developed a competent set of presentation drawing skills and be capable of realistic product renderings in various media. These skills will further be developed in third-year subjects introducing the use of electronic multimedia tools.

SUBJECT NAME: PRODUCTION PLANNING AND CONTROL III
SUBJECT CODE: PLC311T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 74 hours
OVERVIEW OF SYLLABUS:
A study of the basic principles of production planning and control, costing and human relations. Stock control, loss control and loss prevention are also covered.

SUBJECT NAME: PROGRAMMING I
SUBJECT CODE: PGG111T
EVALUATION METHOD: PRACTICAL
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
Components of a microcomputer system, engineering applications of software. Managing personal computers.
SUBJECT NAME: REFRIGERATION AND AIR CONDITIONING IV  
SUBJECT CODE: RAC401T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 68 hours  
OVERVIEW OF SYLLABUS:  

SUBJECT NAME: SENSORS AND PROCESS CONTROL  
SUBJECT CODE: SOA301T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 120 hours  
OVERVIEW OF SYLLABUS:  
This unit teaches students the required knowledge and skills to understand and apply the basic principles of all different types of sensors for process control (flow, temperature, pressure, level), data acquisition, advanced PLC control and SCADA systems. This is done for application in a mechatronic engineering environment. The knowledge and skills are required to define, design, construct, commission and maintain a process control system.

SUBJECT NAME: SOFTWARE DESIGN II  
SUBJECT CODE: SFD211T  
EVALUATION METHOD: PRACTICAL  
TOTAL TUITION TIME: ± 68 hours  
OVERVIEW OF SYLLABUS:  
The basic principles of computer programming and the programming language C++ are used as medium. The following topics are covered: data types and conversions, program actions and loop control, functions and parameters, data structures, pointers. The subject is practice-orientated and assessment is based on a number of programming tasks completed during the semester. (Subject taken from Engineering: Electrical.)

SUBJECT NAME: SOFTWARE DESIGN III  
SUBJECT CODE: SFD301T  
EVALUATION METHOD: PRACTICAL  
TOTAL TUITION TIME: ± 68 hours  
OVERVIEW OF SYLLABUS:  
The basic principles of object-orientated programming. This subject concerns inheritance and polymorphism. Windows applications will be developed, and computer graphics and principles will round off the subject. The subject is practice-orientated and students are evaluated on a number of programming tasks completed during the semester. (Subject taken from Engineering: Electrical.)

SUBJECT NAME: STEAM PLANT III  
SUBJECT CODE: SMP301T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 68 hours  
OVERVIEW OF SYLLABUS:  

SUBJECT NAME: STRENGTH OF MATERIALS I  
SUBJECT CODE: SMT111T  
EVALUATION METHOD: 1 X 3-HOUR PAPER  
TOTAL TUITION TIME: ± 240 hours  
OVERVIEW OF SYLLABUS:  
A detailed and comprehensive general introduction to strength of materials. Basic principles of mechanics in respect of measurements and different units, concentrating on a more in-depth study of the applications of simple stress and strain, shear forces and bending moment graphs.
SUBJECT NAME: STRENGTH OF MATERIALS I
SUBJECT CODE: SMT101T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: STRENGTH OF MATERIALS II
SUBJECT CODE: SMT211B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: STRENGTH OF MATERIALS II
SUBJECT CODE: SMT221T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 136 hours
OVERVIEW OF SYLLABUS:
A detailed and comprehensive general introduction to strength of materials. Basic principles of mechanics respect of measurements and different units, concentrating on a more in-depth study of the applications of simple stress and strain, shear forces and bending moment graphs.

SUBJECT NAME: STRENGTH OF MATERIALS III
SUBJECT CODE: SMT311B
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: STRENGTH OF MATERIALS IV
SUBJECT CODE: SMT411T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:

SUBJECT NAME: STRESS ANALYSIS IV
SUBJECT CODE: SAN401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS:
SUBJECT NAME: THEORY OF MACHINES III
SUBJECT CODE: TMH301T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours

SUBJECT NAME: THERMODYNAMICS II
SUBJECT CODE: TDN211T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 136 hours
OVERVIEW OF SYLLABUS: A detailed and comprehensive general introduction to thermodynamics. Basic principles of thermodynamics in respect of measurements and different units, concentrating on a more in-depth study of the applications of basic principles of gas laws, steam tables and line diagrams.

SUBJECT NAME: THERMODYNAMICS III
SUBJECT CODE: TDN321T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours

SUBJECT NAME: THERMODYNAMICS IV
SUBJECT CODE: TDN401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours

SUBJECT NAME: THERMO-FLOW
SUBJECT CODE: THF201T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 120 hours

SUBJECT NAME: TURBO MACHINES IV
SUBJECT CODE: TRM401T
EVALUATION METHOD: 1 X 3-HOUR PAPER
TOTAL TUITION TIME: ± 68 hours
OVERVIEW OF SYLLABUS: Axial fans and pumps. Axial and centrifugal turbines and compressors.