MSc (ELECTRONIC AND ELECTRICAL SYSTEMS)
Qualification code: PGEE04

Campus where offered: Pretoria Campus

Please note that this qualification is offered in partnership with the ESIEE (France) and is managed by F’SATI 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. 30 ECTS credits are awarded for a research Magister Technologiae: Engineering: Electrical, which the student has to complete before the MSc can be conferred.

The programme may be completed in one of four possible specialisations at TUT: Control and Image Processing, Energy Efficiency, Power Engineering or Telecommunication Technology. The MSc programme is accredited by the Conférence des Grandes Écoles (CGE), a French national institution responsible for the accreditation of MSc programmes in France.

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 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 qualification in Electrical Engineering (or a related field) with an aggregate of 60% for the final year of study obtained from an accredited South African university.

Holders of any other equivalent South African or international qualifications may also be considered, but will have to apply at least six months in advance for the recognition of such qualifications. Candidates will be required to submit an evaluation of their qualifications by the South African Qualifications Authority (SAQA) with their application forms for admission. The University and/or Faculty reserves the right to assess these qualifications and the applicant's suitability and/or competence for admission to the programme. Depending on the nature of such an equivalent qualification, the completion of certain additional subjects may be required. Proof of English proficiency may be required.

b. Recommended subject(s):
Software Engineering IV and at least two specialisation subjects.

c. Selection criteria:
Prospective students may be requested to pass an admission test. Admission depends on available space.

d. Minimum duration:
Two years.

e. Presentation:
Block-mode classes.

f. Intake for the qualification:
January and July.

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

CURRICULUM

ATTENDANCE

<table>
<thead>
<tr>
<th>CODE</th>
<th>SUBJECT</th>
<th>ECTS CREDIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESI5001</td>
<td>Digital Communication V</td>
<td>(7,5)</td>
</tr>
</tbody>
</table>
SUBJECT/MODULE INFORMATION (OVERVIEW OF SYLLABUS)

The syllabus content is subject to change to accommodate industry changes. Please note that a more detailed syllabus is available at the Department or in the study guide that is applicable to a particular subject. On 13 October 2017, the syllabus content was defined as follows:

A

ADVANCED CONTROL SYSTEMS V (ESI5010) CONTINUOUS ASSESSMENT
(Subject custodian: Department of Electrical Engineering)
A selection of advanced control system topics, such as fuzzy control, optimal and multivariable control, robust and non-linear control. (Total tuition time: ± 90 hours)

ADVANCED EMBEDDED SYSTEMS V (ESI5011) CONTINUOUS ASSESSMENT
(Subject custodian: Department of Electrical Engineering)
A selection of advanced embedded system topics, such as multi and co-processor design, real-time and high-speed design. (Total tuition time: ± 90 hours)

D

DIGITAL COMMUNICATION V (ESI5001) CONTINUOUS ASSESSMENT
(Subject custodian: Department of Electrical Engineering)
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. (Total tuition time: ± 90 hours)

DIGITAL CONTROL V (ESI5003) CONTINUOUS ASSESSMENT
(Subject custodian: Department of Electrical Engineering)
System modelling, discrete-time analysis and digital controller design. (Total tuition time: ± 90 hours)

DIGITAL ELECTRONICS V (ESI5002) CONTINUOUS ASSESSMENT
(Subject custodian: Department of Electrical Engineering)
Analysis of advanced digital electronic circuits, best practice design and prototyping principles. (Total tuition time: ± 90 hours)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Subject Custodian</th>
<th>Tuition Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESI5004</td>
<td>Embedded Systems V (ESI5004)</td>
<td>Department of Electrical Engineering</td>
<td>± 90 hours</td>
</tr>
<tr>
<td>ESI5011</td>
<td>Engineering Analysis V (EAN501T)</td>
<td>Department of Electrical Engineering</td>
<td>± 90 hours</td>
</tr>
<tr>
<td>ESI5007</td>
<td>French Language Skills (ESI5007)</td>
<td>Department of Electrical Engineering</td>
<td>± 80 hours</td>
</tr>
<tr>
<td>ESI5005</td>
<td>High-Frequency Systems V (ESI5005)</td>
<td>Department of Electrical Engineering</td>
<td>± 90 hours</td>
</tr>
<tr>
<td>ESI5012</td>
<td>Image Analysis V (ESI5012)</td>
<td>Department of Electrical Engineering</td>
<td>± 90 hours</td>
</tr>
<tr>
<td>ESI5013</td>
<td>Machine Intelligence V (ESI5013)</td>
<td>Department of Electrical Engineering</td>
<td>± 90 hours</td>
</tr>
<tr>
<td>ESI5006</td>
<td>Management V (ESI5006)</td>
<td>Department of Electrical Engineering</td>
<td>± 90 hours</td>
</tr>
<tr>
<td>ESI5014</td>
<td>Real-Time Signal Processing V (ESI5014)</td>
<td>Department of Electrical Engineering</td>
<td>± 90 hours</td>
</tr>
<tr>
<td>ESI5009</td>
<td>RF Design V (ESI5009)</td>
<td>Department of Electrical Engineering</td>
<td>± 90 hours</td>
</tr>
<tr>
<td>ESI5026</td>
<td>Scientific Computing V (ESI5026)</td>
<td>Department of Electrical Engineering</td>
<td>Not available</td>
</tr>
</tbody>
</table>
SIGNAL THEORY V (ESI5021) CONTINUOUS ASSESSMENT

(Subject custodian: Department of Electrical Engineering)
Signal spaces, mappings, deterministic signal theory and stochastic signal theory. (Total tuition time: ± 90 hours)

SOFTWARE ENGINEERING V (ESI5022) CONTINUOUS ASSESSMENT

(Subject custodian: Department of Electrical Engineering)
Software engineering fundamentals, UML design principles and operating system basics. (Total tuition time: ± 90 hours)

SPECIAL TOPICS I (ESI5023) CONTINUOUS ASSESSMENT
SPECIAL TOPICS II (ESI5024) CONTINUOUS ASSESSMENT
SPECIAL TOPICS III (ESI5025) CONTINUOUS ASSESSMENT

(Subject custodian: Department of Electrical Engineering)
Special topics based on a selection of seminal research papers from a chosen field. (Total tuition time: ± 90 hours)

TELECOMMUNICATION NETWORKS V (ESI5008) CONTINUOUS ASSESSMENT

(Subject custodian: Department of Electrical Engineering)
Fixed networks, mobile networks, RF and optical networks. (Total tuition time: ± 90 hours)