Specialisation

Electrical Engineering

ELECAH

The School of Electrical Engineering & Telecommunications offers a wide range of undergraduate and postgraduate study in all areas of the professions of Electrical Engineering and Telecommunications. The School's streams within the undergraduate Bachelor of Engineering (Hons) program in Electrical and Telecommunications Engineering continue to act as models for educating engineers in tomorrow's technology. Options within Electrical Engineering include: Telecommunications, Photonics, Systems and Control, Energy Systems, Microelectronics, and Signal Processing. The BE degree programs in Electrical Engineering are accredited by the Engineers Australia as meeting the requirements for admission to graduate membership.

The undergraduate curricula are being progressively revised to provide flexible training to suit the future needs of students. Individual student needs can be further met by substitution provisions within the programs.
<table>
<thead>
<tr>
<th><strong>Faculty</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty of Engineering</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>School</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>School of Electrical Engineering &amp; Telecommunications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Study Level</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Minimum Units of Credit</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>168</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Specialisation Type</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Honours</td>
</tr>
</tbody>
</table>
Available in Program(s)

Program(s) in which this honours is available

Bachelor of Engineering (Honours) - **BE (Hons)**

**3707 Engineering (Honours)**
Faculty: Faculty of Engineering  
Campus: Kensington  
Units of Credit: 192  
Typical Duration: 4 Years

Bachelor of Engineering (Honours) - **BE (Hons)**

Master of Biomedical Engineering - **MBiomedE**

**3768 Engineering (Honours)/Biomedical Engineering**
Faculty: Faculty of Engineering  
Campus: Kensington  
Units of Credit: 240  
Typical Duration: 5 Years
Specialisation Structure

Students must complete 168 UOC.

Level 1 Core Courses

Students must take 48 UOC of the following courses.

COMP1521  |  6 UOC
Computer Systems Fundamentals

ELEC1111  |  6 UOC
Electrical and Telecommunications Engineering

ENGG1000  |  6 UOC
Introduction to Engineering Design and Innovation

PHYS1231  |  6 UOC
Higher Physics 1B

One of the following:

MATH1131  |  6 UOC
Mathematics 1A

MATH1141  |  6 UOC
Higher Mathematics 1A

One of the following:

MATH1231  |  6 UOC
Mathematics 1B

MATH1241  |  6 UOC
Higher Mathematics 1B

One of the following:

PHYS1121  |  6 UOC
Physics 1A
One of the following:

**COMP1511 | 6 UOC**
Programming Fundamentals

**COMP1911 | 6 UOC**
Computing 1A

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**Level 2 Core Courses**

Students must take 36 UOC of the following courses.

**ELEC2133 | 6 UOC**
Analogue Electronics

**ELEC2134 | 6 UOC**
Circuits and Signals

**ELEC2141 | 6 UOC**
Digital Circuit Design

**ELEC2142 | 6 UOC**
Embedded Systems Design

**MATH2069 | 6 UOC**
Mathematics 2A

**MATH2099 | 6 UOC**
Mathematics 2B

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**Level 3 Core Courses**

Students must take 42 UOC of the following courses.

**ELEC3104 | 6 UOC**
Digital Signal Processing
<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC3105</td>
<td>6</td>
</tr>
<tr>
<td>Electrical Energy</td>
<td></td>
</tr>
<tr>
<td>ELEC3106</td>
<td>6</td>
</tr>
<tr>
<td>Electronics</td>
<td></td>
</tr>
<tr>
<td>ELEC3114</td>
<td>6</td>
</tr>
<tr>
<td>Control Systems</td>
<td></td>
</tr>
<tr>
<td>ELEC3115</td>
<td>6</td>
</tr>
<tr>
<td>Electromagnetic Engineering</td>
<td></td>
</tr>
<tr>
<td>ELEC3117</td>
<td>6</td>
</tr>
<tr>
<td>Electrical Engineering Design</td>
<td></td>
</tr>
<tr>
<td>TELE3113</td>
<td>6</td>
</tr>
<tr>
<td>Analogue and Digital Communications</td>
<td></td>
</tr>
</tbody>
</table>

**Level 4 Core Courses**

Students must take 24 UOC of the following courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC4122</td>
<td>6</td>
</tr>
<tr>
<td>Strategic Leadership and Ethics</td>
<td></td>
</tr>
<tr>
<td>ELEC4123</td>
<td>6</td>
</tr>
<tr>
<td>Electrical Design Proficiency</td>
<td></td>
</tr>
<tr>
<td>ELEC4951</td>
<td>4</td>
</tr>
<tr>
<td>Research Thesis A</td>
<td></td>
</tr>
<tr>
<td>ELEC4952</td>
<td>4</td>
</tr>
<tr>
<td>Research Thesis B</td>
<td></td>
</tr>
<tr>
<td>ELEC4953</td>
<td>4</td>
</tr>
<tr>
<td>Research Thesis C</td>
<td></td>
</tr>
</tbody>
</table>
**Level 1 Prescribed Electives**

Students can take up to a maximum of 12 UOC of the following courses.

Note:
- Students choosing the recommended ELEC1111 and COMP1521 Year 1 electives will gain two Level 3/Level 4 Electives later in the program.
- CHEM1031 and CHEM1041 will only be available to students enrolled in a program which has a Chemistry major.

- **BABS1201** | 6 UOC  
  Molecules, Cells and Genes

- **BIOM1010** | 6 UOC  
  Engineering in Medicine and Biology

- **BIOS1301** | 6 UOC  
  Ecology, Sustainability and Environmental Science

- **CEIC1000** | 6 UOC  
  Sustainable Product Engineering and Design

- **CHEM1011** | 6 UOC  
  Chemistry 1A: Atoms, Molecules and Energy

- **CHEM1021** | 6 UOC  
  Chemistry 1B: Elements, Compounds and Life

- **CHEM1031** | 6 UOC  
  Higher Chemistry 1A: Atoms, Molecules and Energy

- **CHEM1041** | 6 UOC  
  Higher Chemistry 1B: Elements, Compounds and Life

- **CHEM1811** | 6 UOC  
  Engineering Chemistry 1A
CHEM1821 | 6 UOC
Engineering Chemistry 1B

COMP1521 | 6 UOC
Computer Systems Fundamentals

COMP1531 | 6 UOC
Software Engineering Fundamentals

CVEN1701 | 6 UOC
Environmental Principles and Systems

ELEC1111 | 6 UOC
Electrical and Telecommunications Engineering

ENGG1100 | 6 UOC
Grand Challenges for Engineering

ENGG1200 | 6 UOC
Undergraduate Special Projects

ENGG1300 | 6 UOC
Engineering Mechanics

ENGG1400 | 6 UOC
Engineering Infrastructure Systems

GEOS1111 | 6 UOC
Fundamentals of Geology

GMAT1110 | 6 UOC
Surveying and Geospatial Engineering

MATH1081 | 6 UOC
Discrete Mathematics
MATS1101  |  6 UOC
Engineering Materials and Chemistry

MINE1010  |  6 UOC
Mineral Resources Engineering

PHYS1231  |  6 UOC
Higher Physics 1B

PSYC1001  |  6 UOC
Psychology 1A

SOLA1070  |  6 UOC
Sustainable Energy

**Level 3 Electives**

Students can take up to a maximum of 6 UOC of the following courses.

COMP3211  |  6 UOC
Computer Architecture

COMP3231  |  6 UOC
Operating Systems

ELEC2146  |  6 UOC
Electrical Engineering Modelling and Simulation

ELEC3111  |  6 UOC
Distributed Energy Generation

ELEC3145  |  6 UOC
Real Time Instrumentation

ELEC3705  |  6 UOC
Fundamentals of Quantum Engineering

ENGG3060  |  6 UOC
Maker Games

MATH3101  |  6 UOC
Computational Mathematics

MATH3121  |  6 UOC
Mathematical Methods and Partial Differential Equations

MATH3161  |  6 UOC
Optimization

MATH3201  |  6 UOC
Dynamical Systems and Chaos

MATH3261  |  6 UOC
Fluids, Oceans and Climate

MATH3411  |  6 UOC
Information, Codes and Ciphers

TELE3118  |  6 UOC
Network Technologies

TELE3119  |  6 UOC
Trusted Networks

**Level 4 Electives**

Students must take at least 12 UOC of the following courses. Students who have chosen ELEC1111 and COMP1521 as their Year 1 electives may take up to 12 UOC more of the courses below

ELEC4445  |  6 UOC
Entrepreneurial Engineering
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC4601</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Digital and Embedded Systems Design</td>
<td></td>
</tr>
<tr>
<td>ELEC4602</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Microelectronic Design and Technology</td>
<td></td>
</tr>
<tr>
<td>ELEC4603</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Solid State Electronics</td>
<td></td>
</tr>
<tr>
<td>ELEC4604</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Radio Frequency Electronics</td>
<td></td>
</tr>
<tr>
<td>ELEC4605</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Quantum Devices and Computers</td>
<td></td>
</tr>
<tr>
<td>ELEC4611</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Power System Equipment</td>
<td></td>
</tr>
<tr>
<td>ELEC4612</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Power System Analysis</td>
<td></td>
</tr>
<tr>
<td>ELEC4613</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Electrical Drive Systems</td>
<td></td>
</tr>
<tr>
<td>ELEC4614</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Power Electronics</td>
<td></td>
</tr>
<tr>
<td>ELEC4617</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Power System Protection</td>
<td></td>
</tr>
<tr>
<td>ELEC4621</td>
<td>6 UOC</td>
</tr>
<tr>
<td>Advanced Digital Signal Processing</td>
<td></td>
</tr>
<tr>
<td>ELEC4622</td>
<td>6 UOC</td>
</tr>
</tbody>
</table>
Recommended Prescribed Elective

When undertaking the specialisation as a part of a single degree program, the program consists of the Electrical Engineering stream plus 12 UOC of General
Education plus 12 UOC of foundational or disciplinary Prescribed Electives.

Recommended Level 1 Prescribed Electives for this specialisation are:
- COMP1521 Computer Systems Fundamentals (6 UOC)
- ELEC1111 Electrical and Telecommunications Engineering (6 UOC)

NOTE: When ELEC1111 and COMP1521 are chosen as the L1 electives in Year 1, an additional 12 UOC of Foundational or Disciplinary electives are taken in Year 4.

**Industrial Training**

Students undertake 60 days of industrial training.

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**Enrolment Disclaimer**

Unless advised otherwise by your program authority, you should follow the rules for the handbook for the year you commenced your program. You are also responsible for ensuring you enrol in courses according to your program requirements. myUNSW enrolment checks that you have met enrolment requirements such as pre-requisites for individual courses but not that a course will count towards your program requirements.
Additional Information

Industrial Experience Requirements

All students are required to undertake mandatory industrial training. Each student is personally responsible for arranging and completing the full 60 days compulsory industrial training prescribed as part of the requirements for the award of the degree. Industrial training should be concurrent with enrolment and is best accumulated in the summer recesses at the end of the second and third years of the program, but it must be completed before graduating. Industrial training should be in the area of engineering design and/or project work, but limited credit may be given for work of a non-engineering nature. It is preferable that all 60 days be completed with one or two organisations. Students should, in general, work with professional engineers and take an active part in their work in the design of equipment, solving of engineering problems, or any other work that is relevant to the profession of Engineering.

Students are required to submit a written report on their industry placements, typically 2000-3000 words, describing the organisation of the Company, summarising the work done and the training received. The report must be accompanied by certification of their industrial placement by a senior company representative.

Industrial Training will be assessed as a compulsory part of the course ELEC4122 Strategic Leadership and Ethics. Students must complete the industrial training requirement in order to receive a completed assessment for this course, but the industrial training assessment does not affect the mark received for ELEC4122.
Pre-2019 Handbook Editions

Access past handbook editions (2018 and prior)

Pre-2019 Handbook Editions
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Authorised by Deputy Vice-Chancellor (Academic)
CRICOS Provider Code 00098G
ABN: 57 195 873 179