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>
<th>Faculty of Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School</strong></td>
<td>School of Electrical Engineering &amp; Telecommunications</td>
</tr>
<tr>
<td><strong>Study Level</strong></td>
<td>Undergraduate</td>
</tr>
<tr>
<td><strong>Minimum Units of Credit</strong></td>
<td>168</td>
</tr>
<tr>
<td><strong>Specialisation Type</strong></td>
<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
Higher Physics 1A

One of the following:

Programming Fundamentals

Computing 1A

Level 2 Core Courses

Students must take 36 UOC of the following courses.

Analog Electronics

Circuits and Signals

Digital Circuit Design

Embedded Systems Design

Mathematics 2A

Mathematics 2B

Level 3 Core Courses

Students must take 42 UOC of the following courses.

Digital Signal Processing
Level 4 Core Courses

Students must take 24 UOC of the following courses.

ELEC4122  |  6 UOC
Strategic Leadership and Ethics

ELEC4123  |  6 UOC
Electrical Design Proficiency

ELEC4951  |  4 UOC
Research Thesis A

ELEC4952  |  4 UOC
Research Thesis B

ELEC4953  |  4 UOC
Research Thesis C
## 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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BABS1201</td>
<td>6</td>
<td>Molecules, Cells and Genes</td>
</tr>
<tr>
<td>BIOM1010</td>
<td>6</td>
<td>Engineering in Medicine and Biology</td>
</tr>
<tr>
<td>BIOS1301</td>
<td>6</td>
<td>Ecology, Sustainability and Environmental Science</td>
</tr>
<tr>
<td>CEIC1000</td>
<td>6</td>
<td>Sustainable Product Engineering and Design</td>
</tr>
<tr>
<td>CHEM1011</td>
<td>6</td>
<td>Chemistry 1A: Atoms, Molecules and Energy</td>
</tr>
<tr>
<td>CHEM1021</td>
<td>6</td>
<td>Chemistry 1B: Elements, Compounds and Life</td>
</tr>
<tr>
<td>CHEM1031</td>
<td>6</td>
<td>Higher Chemistry 1A: Atoms, Molecules and Energy</td>
</tr>
<tr>
<td>CHEM1041</td>
<td>6</td>
<td>Higher Chemistry 1B: Elements, Compounds and Life</td>
</tr>
<tr>
<td>CHEM1811</td>
<td>6</td>
<td>Engineering Chemistry 1A</td>
</tr>
<tr>
<td>Code</td>
<td>UOC</td>
<td>Course Title</td>
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<tr>
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</tr>
<tr>
<td>CHEM1821</td>
<td>6</td>
<td>Engineering Chemistry 1B</td>
</tr>
<tr>
<td>COMP1521</td>
<td>6</td>
<td>Computer Systems Fundamentals</td>
</tr>
<tr>
<td>COMP1531</td>
<td>6</td>
<td>Software Engineering Fundamentals</td>
</tr>
<tr>
<td>CVEN1701</td>
<td>6</td>
<td>Environmental Principles and Systems</td>
</tr>
<tr>
<td>ELEC1111</td>
<td>6</td>
<td>Electrical and Telecommunications Engineering</td>
</tr>
<tr>
<td>ENGG1100</td>
<td>6</td>
<td>Grand Challenges for Engineering</td>
</tr>
<tr>
<td>ENGG1200</td>
<td>6</td>
<td>Undergraduate Special Projects</td>
</tr>
<tr>
<td>ENGG1300</td>
<td>6</td>
<td>Engineering Mechanics</td>
</tr>
<tr>
<td>ENGG1400</td>
<td>6</td>
<td>Engineering Infrastructure Systems</td>
</tr>
<tr>
<td>GEOS1111</td>
<td>6</td>
<td>Fundamentals of Geology</td>
</tr>
<tr>
<td>GMAT1110</td>
<td>6</td>
<td>Surveying and Geospatial Engineering</td>
</tr>
<tr>
<td>MATH1081</td>
<td>6</td>
<td>Discrete Mathematics</td>
</tr>
</tbody>
</table>
Students can take up to a maximum of 6 UOC of the following courses.

**Level 3 Electives**

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

ELEC4623  |  6 UOC
Biomedical Instrumentation, Measurement and Design

ELEC4631  |  6 UOC
Continuous - Time Control System Design

ELEC4632  |  6 UOC
Computer Control Systems

ELEC4633  |  6 UOC
Real-Time Engineering

PHTN4661  |  6 UOC
Optical Circuits and Fibres

PHTN4662  |  6 UOC
Photonic Networks

TELE4642  |  6 UOC
Network Performance

TELE4651  |  6 UOC
Wireless Communication Technologies

TELE4652  |  6 UOC
Mobile and Satellite Communications Systems

TELE4653  |  6 UOC
Digital Modulation and Coding

**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**

You are 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. Do not assume that because you have enrolled in a course that the course will be credited towards your program.
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)
The information contained in this Handbook is indicative only. While every effort is made to keep this information up-to-date, the University reserves the right to discontinue or vary arrangements, programs and courses at any time without notice and at its discretion. While the University will try to avoid or minimise any inconvenience, changes may also be made to programs, courses and staff after enrolment. The University may also set limits on the number of students in a course.

Authorised by Deputy Vice-Chancellor (Academic)
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ABN: 57 195 873 179