Handbook 2019

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.
Faculty
Faculty of Engineering

School
School of Electrical Engineering & Telecommunications

Study Level
Undergraduate

Minimum Units of Credit
168

Specialisation Type
Honours
### Available in Program(s)

Program(s) in which this honours is available

<table>
<thead>
<tr>
<th>Program</th>
<th>Code</th>
<th>Description</th>
<th>Faculty</th>
<th>Campus</th>
<th>Units of Credit</th>
<th>Typical Duration</th>
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<tbody>
<tr>
<td>Bachelor of Engineering (Honours) - BE (Hons)</td>
<td>3707 Engineering (Honours)</td>
<td>Faculty: Faculty of Engineering&lt;br&gt;Campus: Kensington&lt;br&gt;Units of Credit: 192&lt;br&gt;Typical Duration: 4 Years</td>
<td>Faculty of Engineering</td>
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<td>4 Years</td>
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<td>Bachelor of Engineering (Honours) - BE (Hons)</td>
<td>3768 Engineering (Honours)/Biomedical Engineering</td>
<td>Master of Biomedical Engineering - MBiomedE</td>
<td>Faculty: Faculty of Engineering&lt;br&gt;Campus: Kensington&lt;br&gt;Units of Credit: 240&lt;br&gt;Typical Duration: 5 Years</td>
<td>Faculty of Engineering</td>
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Specialisation Structure

Students must complete 168 UOC.

Level 1 Core Courses

Students must take 36 UOC of the following courses.

**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

**PHYS1131 | 6 UOC**  
Higher Physics 1A

One of the following:

**COMP1511 | 6 UOC**  
Programming Fundamentals
Level 2 Core Courses

Students must take 36 UOC of the following courses.

COMPI1911 | 6 UOC  
Computing 1A

ELEC1111 | 6 UOC  
Electrical and Telecommunications Engineering

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

Level 3 Core Courses

Students must take 42 UOC of the following courses.

ELEC3104 | 6 UOC  
Digital Signal Processing
ELEC3105  |  6 UOC  
Electrical Energy

ELEC3106  |  6 UOC  
Electronics

ELEC3114  |  6 UOC  
Control Systems

ELEC3115  |  6 UOC  
Electromagnetic Engineering

ELEC3117  |  6 UOC  
Electrical Engineering Design

TELE3113  |  6 UOC  
Analogue and Digital Communications

**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.

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

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

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

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

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

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

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

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

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**CHEM1811 | 6 UOC**
Engineering Chemistry 1A
<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
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<tbody>
<tr>
<td>CHEM1821</td>
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<tr>
<td>COMPI521</td>
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<tr>
<td>COMPI531</td>
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</tr>
<tr>
<td>CVEN1701</td>
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<td>ELEC1111</td>
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<td>ENGG1100</td>
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<tr>
<td>ENGG1200</td>
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<td>ENGG1300</td>
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<td>ENGG1400</td>
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<td>GEOS1111</td>
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<td>GMAT1110</td>
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<tr>
<td>MATH1081</td>
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</tbody>
</table>

Course Titles:

- Engineering Chemistry 1B
- Computer Systems Fundamentals
- Software Engineering Fundamentals
- Environmental Principles and Systems
- Electrical and Telecommunications Engineering
- Grand Challenges for Engineering
- Undergraduate Special Projects
- Engineering Mechanics
- Engineering Infrastructure Systems
- Fundamentals of Geology
- Surveying and Geospatial Engineering
- 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

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 who have chosen ELEC1111 and COMP1521 as Year 1 electives may take up to 12 UOC of courses below from the following areas; Microelectronics, Energy Systems, Signal Processing, Systems and Control, Business Administration, Data and Mobile Communications and Photonics

ELEC4445  |  6 UOC
Entrepreneurial Engineering

ELEC4601  |  6 UOC
Digital and Embedded Systems Design

ELEC4602  |  6 UOC
<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ELEC4603</td>
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<tr>
<td>Solid State Electronics</td>
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<td>ELEC4604</td>
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<td>Radio Frequency Electronics</td>
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<td>ELEC4605</td>
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<td>Quantum Devices and Computers</td>
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<td>ELEC4611</td>
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<td>Power System Equipment</td>
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<td>ELEC4612</td>
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<td>Power System Analysis</td>
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<td>ELEC4613</td>
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<td>Electrical Drive Systems</td>
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<td>ELEC4614</td>
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<td>Power Electronics</td>
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<td>ELEC4617</td>
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<td>Power System Protection</td>
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<td>ELEC4621</td>
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<tr>
<td>Advanced Digital Signal Processing</td>
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<td>ELEC4622</td>
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<tr>
<td>Multimedia Signal Processing</td>
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<tr>
<td>ELEC4623</td>
<td>6</td>
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<tr>
<td>Biomedical Instrumentation, Measurement and Design</td>
<td></td>
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</tbody>
</table>
Computing (COMP) Courses

- Students taking COMP1911 may be required to complete a bridging course before enrolling in COMP1521.
- Students wishing to take further computing after 1st year should take both COMP1511 and COMP1521.
- Students in 3785 BE(Hons)/BSc(Computer Science) dual degree should take COMP1521 as one of their Year 1 electives.
Industrial Training

Students undertake 60 days of industrial training.

Recommended Level 1 Prescribed Elective

- COMP1521 Computer Systems Fundamentals (6 UOC)
- ELEC1111 Electrical and Telecommunications Engineering (6 UOC)

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)

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