Telecommunications engineering is the most rapidly developing and dynamic field of Engineering. The School's undergraduate BE (Hons) program in Telecommunications continue to act as a model for educating engineers in tomorrow's technology. Options within Telecommunications include: Photonics, Systems and Control, Energy Systems, Microelectronics and Signal Processing. The Degree programs are accredited by 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.

The Telecommunications stream consists of 168 UOC as described below. The stream structure outlined below gives one sequence of courses that fulfils the requirements of the degree. The timing of the general education courses and elective courses may be modified to optimize the student's choice of courses. While some courses are given twice a year, many courses are given only once a year. In addition, courses may have prerequisites and exclusions. Students are strongly encouraged to consult the Electrical Engineering School website for the recommended program structure and for advice on course selection sequences that are consistent with timetabling and availability.
<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

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

3707 Engineering (Honours)

Faculty: Faculty of Engineering

Campus: Kensington

Units of Credit: 192

Typical Duration: 4 Years

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**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
PHYS1131 | 6 UOC
Higher Physics 1A

One of the following:
COMP1511 | 6 UOC
Programming Fundamentals

COMP1911 | 6 UOC
Computing 1A

**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

**Level 3 Core Courses**

Students must take 48 UOC of the following courses.

ELEC3104 | 6 UOC
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
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 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
<table>
<thead>
<tr>
<th>Code</th>
<th>UOC</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM1811</td>
<td>6</td>
<td>Engineering Chemistry 1A</td>
</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>
</tbody>
</table>
**Level 3 Prescribed 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

**ELEC3105 | 6 UOC**
Electrical Energy

**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

Level 4 Prescribed 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>
When undertaking the specialisation as a part of a single degree program, the program consists of the Telecommunications Engineering stream plus 12 UOC of

**Recommended Prescribed Electives**

<table>
<thead>
<tr>
<th>Code</th>
<th>UOC</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC4623</td>
<td>6</td>
<td>Multimedia Signal Processing</td>
</tr>
<tr>
<td>ELEC4631</td>
<td>6</td>
<td>Biomedical Instrumentation, Measurement and Design</td>
</tr>
<tr>
<td>ELEC4632</td>
<td>6</td>
<td>Continuous - Time Control System Design</td>
</tr>
<tr>
<td>ELEC4633</td>
<td>6</td>
<td>Computer Control Systems</td>
</tr>
<tr>
<td>PHTN4661</td>
<td>6</td>
<td>Real-Time Engineering</td>
</tr>
<tr>
<td>PHTN4662</td>
<td>6</td>
<td>Optical Circuits and Fibres</td>
</tr>
<tr>
<td>TELE4642</td>
<td>6</td>
<td>Photonic Networks</td>
</tr>
<tr>
<td>TELE4651</td>
<td>6</td>
<td>Network Performance</td>
</tr>
<tr>
<td>TELE4652</td>
<td>6</td>
<td>Wireless Communication Technologies</td>
</tr>
<tr>
<td>TELE4653</td>
<td>6</td>
<td>Mobile and Satellite Communications Systems</td>
</tr>
<tr>
<td>TELE4653</td>
<td>6</td>
<td>Digital Modulation and Coding</td>
</tr>
</tbody>
</table>
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 Requirement**

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)

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