Telecommunications

TELEAH

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.
**Faculty**
Faculty of Engineering

**School**
School of Electrical Engineering & Telecommunications

**Study Level**
Undergraduate

**Minimum Units of Credit**
168

**Specialisation Type**
Honours
<table>
<thead>
<tr>
<th>Program(s) in which this honours is available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Engineering (Honours) - <strong>BE (Hons)</strong></td>
</tr>
<tr>
<td><strong>3707 Engineering (Honours)</strong></td>
</tr>
<tr>
<td>Faculty: Faculty of Engineering</td>
</tr>
<tr>
<td>Campus: Kensington</td>
</tr>
<tr>
<td>Units of Credit: 192</td>
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<tr>
<td>Typical Duration: 4 Years</td>
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<tr>
<td>Bachelor of Engineering (Honours) - <strong>BE (Hons)</strong></td>
</tr>
<tr>
<td>Master of Biomedical Engineering - <strong>MBiomedE</strong></td>
</tr>
<tr>
<td><strong>3768 Engineering (Honours)/Biomedical Engineering</strong></td>
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<tr>
<td>Faculty: Faculty of Engineering</td>
</tr>
<tr>
<td>Campus: Kensington</td>
</tr>
<tr>
<td>Units of Credit: 240</td>
</tr>
<tr>
<td>Typical Duration: 5 Years</td>
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</table>
**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
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

TELE3118  |  6 UOC  
Network Technologies

TELE3119  |  6 UOC  
Trusted Networks

**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 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>Course Code</th>
<th>UOC</th>
<th>Course Name</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>
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 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
<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOCs</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>ELEC3145</td>
<td>6 UOC</td>
<td>Distributed Energy Generation</td>
</tr>
<tr>
<td>ELEC3705</td>
<td>6 UOC</td>
<td>Real Time Instrumentation</td>
</tr>
<tr>
<td>ENGG3060</td>
<td>6 UOC</td>
<td>Fundamentals of Quantum Engineering</td>
</tr>
<tr>
<td>MATH3101</td>
<td>6 UOC</td>
<td>Computational Mathematics</td>
</tr>
<tr>
<td>MATH3121</td>
<td>6 UOC</td>
<td>Mathematical Methods and Partial Differential Equations</td>
</tr>
<tr>
<td>MATH3161</td>
<td>6 UOC</td>
<td>Optimization</td>
</tr>
<tr>
<td>MATH3201</td>
<td>6 UOC</td>
<td>Dynamical Systems and Chaos</td>
</tr>
<tr>
<td>MATH3261</td>
<td>6 UOC</td>
<td>Fluids, Oceans and Climate</td>
</tr>
<tr>
<td>MATH3411</td>
<td>6 UOC</td>
<td>Information, Codes and Ciphers</td>
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</table>

**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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOCs</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>ELEC4445</td>
<td>6 UOC</td>
<td>Entrepreneurial Engineering</td>
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<tr>
<td>Code</td>
<td>UOC</td>
<td>Course Name</td>
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<tr>
<td>----------</td>
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</tr>
<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 Electives**

When undertaking the specialisation as a part of a single degree program, the program consists of the Telecommunications 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 Requirement**

Students undertake 60 days of industrial training

**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