Overview

Engineering degrees offered by UNSW Canberra aim to provide an outstanding engineering education to future leaders in the Australian Defence Force and to civilian students to pursue excellence through contributions to research, the profession, industry and the community.

The Bachelor of Engineering (Honours) in Electrical Engineering is of four years duration and the degree may be awarded at Honours Class I, Honours Class II, Division I or Honours Class II, Division II. These Honours levels will be displayed on the final testamur. Candidates who do not achieve Honours Class I or II will receive a Bachelor of Engineering (Honours) in Electrical Engineering with no honours level displayed.

The Bachelor of Engineering (Honours) in Electrical Engineering program at UNSW Canberra has been granted full accreditation by Engineers Australia and has been recognised by the Institute of Electrical and Electronics Engineers.

The Bachelor of Engineering (Honours) in Electrical Engineering is built on a foundation of mathematics, computing science and physical science. A small component of electrical engineering is introduced in the first year, with progressively larger components in second and third year. The final year is devoted exclusively to electrical engineering courses. Each year of the program comprises a number of discipline-based courses and courses taught by other discipline areas. Most courses in the first three years of the program are common for all electrical engineering students. In the fourth year students have the option to select specialty topics in areas such as communications, surveillance and radar, computer engineering and guided weapons electronics.

Electrical Engineering is one of the newer branches of engineering. It has its origin in the turning to practical use of the discoveries of Faraday, Ampere, Maxwell and a
number of other eminent 19th century physicists. It has remained the most strongly science-oriented branch of engineering.

At first it had its major impact by providing the means for the generation, distribution and utilisation of electric power. However, while this remains an important sub-area of the whole discipline, the last few decades particularly have seen a rapid and extensive diversification into the fields of computers and control as well as electronics and communications, and beyond them into such areas as biology, medicine and space technology. It is now true to say that there are very few areas of civilised activity that have remained untouched by the ideas and products of modern electrical engineering. The absorption of recent scientific development has been very rapid and has demanded a fully developed scientific outlook on the part of electrical engineers for a proper understanding of the problems involved. Many devices, scarcely more than laboratory prototypes a decade ago, are now in widespread use as fully engineered hardware.
<table>
<thead>
<tr>
<th><strong>Faculty</strong></th>
<th>UNSW Canberra at ADFA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Campus</strong></td>
<td>Canberra</td>
</tr>
<tr>
<td><strong>Study Level</strong></td>
<td>Undergraduate</td>
</tr>
<tr>
<td><strong>Typical duration</strong></td>
<td>4 Years</td>
</tr>
<tr>
<td><strong>Delivery Mode</strong></td>
<td>Face-to-face</td>
</tr>
<tr>
<td><strong>Intake Period</strong></td>
<td>Semester 1</td>
</tr>
<tr>
<td><strong>Academic Calendar</strong></td>
<td>UNSW Canberra Calendar</td>
</tr>
<tr>
<td><strong>Minimum Units of Credit</strong></td>
<td>192</td>
</tr>
<tr>
<td><strong>Award type</strong></td>
<td>Bachelors Honours</td>
</tr>
<tr>
<td><strong>Award(s)</strong></td>
<td>Bachelor of Engineering (Honours) - BE (Hons)</td>
</tr>
</tbody>
</table>
Learning Outcomes

1. Students will be able to relate a quantitative, theory-based understanding of the sciences and fundamentals of electrical engineering (encompassing circuit analysis and design, signal processing, dynamical systems, control, power systems and communications).

2. Students will be able to appropriately select and apply the mathematical, statistical, programming and computational tools and techniques which underpin electrical engineering.

3. Students will demonstrate a comprehensive understanding of electrical systems and components, and articulate directions of future research and knowledge development in electrical engineering.

4. Students will synthesise circuit and systems design practice, contextual factors, norms and accountabilities in and the limitations on electrical engineering.

5. Students will define, conduct experiments on and analyse complex, open-ended problems and apply appropriate methods for their solution.

6. Students will demonstrate proficiency in applying systematic engineering synthesis and design processes, and critically evaluating and effectively communicating the results and implications to all audiences.

7. Students will be able to operate in collaborative environments, as leader or member of interdisciplinary teams.

8. Students will demonstrate independence, creativity and ethical conduct, and explain the importance of user-focused and sustainable solutions.

Graduate Capabilities:

For more information on Graduate Capabilities, please click on this link.
Program Structure

Students must complete 192 UOC as a standalone program.

The Bachelor of Engineering (Honours) in Electrical Engineering requires a prescribed program structure as determined by the engineering program chosen. Each year of the program comprises a number of School-based courses (identified by the prefix ZEIT) and courses taught by other Schools within UNSW Canberra.

Completion of each year, thereby allowing progression to the next year, is normally achieved by satisfactory progress in each of the courses given in that year. At the discretion of the Head of School, students may be allowed to concurrently enrol in courses from more than one year of the program.

1. Core Courses - 162 UOC
2. Technical Elective Courses - 18 UOC
3. General Education Courses - 12 UOC

Level 1 Core Courses

Students must take 48 UOC of the following courses.

ZEIT1102 6 UOC
Introduction to Programming

ZEIT1206 6 UOC
Design of Electronic Circuits 1

ZEIT1208 6 UOC
Introduction to Electrical Engineering

ZPEM1303 6 UOC
Engineering Mathematics 1A

ZPEM1304 6 UOC
Engineering Mathematics 1B

ZPEM1307 6 UOC
Computational Problem Solving
Level 2 Core Courses

Students must take 48 UOC of the following courses.

ZETI2103  |  6 UOC  
Data Structures and Representation

ZETI2207  |  6 UOC  
Design of Electronic Circuits 2

ZETI2208  |  6 UOC  
Programmable Digital Systems

ZETI2209  |  6 UOC  
Principles of Electrical Engineering

ZINT2100  |  6 UOC  
Introduction to Cyber-Security: Policy & Operations

ZETM2309  |  6 UOC  
Engineering Mathematics 2A

ZETM2310  |  6 UOC  
Engineering Mathematics 2B

ZETM2502  |  6 UOC  
Physics 2B: Electrons, Photons and Matter

Level 3 Core Courses
Students must take 42 UOC of the following courses.

ZEIT3215  |  6 UOC
Signals and Systems

ZEIT3216  |  6 UOC
Design of Electronic Circuits 3

ZEIT3218  |  6 UOC
Communications Techniques

ZEIT3220  |  6 UOC
Engineering Electromagnetics

ZEIT3221  |  6 UOC
Digital Signal Processing and Control

ZEIT3222  |  6 UOC
Control Engineering

ZEIT3506  |  6 UOC
Systems Engineering / Management

**Level 4 Core Courses**

Students must take 24 UOC of the following courses.

ZEIT4224  |  6 UOC
Electrical Power, Machines and Power Electronics

ZEIT4230  |  6 UOC
Electrical Engineering Design Practice

ZEIT4500  |  6 UOC
Engineering Project A

ZEIT4501  |  6 UOC
Technical Electives Group A

Students can take up to a maximum of 18 UOC of the following courses.

- ZEIT4216 | 6 UOC
  Occasional Option 2

- ZEIT4217 | 6 UOC
  Occasional Option 3

- ZEIT4218 | 6 UOC
  Occasional Option 4

- ZEIT4225 | 6 UOC
  Satellite Communications

- ZEIT4226 | 6 UOC
  Digital Image Processing and Enhancement

- ZEIT4227 | 6 UOC
  Radar Techniques and Applications

- ZEIT4297 | 6 UOC
  Electrical Engineering Project Extension

- ZEIT4702 | 6 UOC
  Instrumentation

- ZEIT4705 | 6 UOC
  Marine Project

Technical Electives Group B

Students can take up to a maximum of 6 UOC of the following courses.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZEIT2502</td>
<td>6</td>
</tr>
<tr>
<td>Fundamentals of Flight</td>
<td></td>
</tr>
<tr>
<td>ZEIT3102</td>
<td>6</td>
</tr>
<tr>
<td>Cryptography</td>
<td></td>
</tr>
<tr>
<td>ZEIT3113</td>
<td>6</td>
</tr>
<tr>
<td>Computer Languages and Algorithms</td>
<td></td>
</tr>
<tr>
<td>ZEIT3114</td>
<td>6</td>
</tr>
<tr>
<td>Internetworking</td>
<td></td>
</tr>
<tr>
<td>ZEIT3302</td>
<td>6</td>
</tr>
<tr>
<td>Software Project Management</td>
<td></td>
</tr>
<tr>
<td>ZEIT3404</td>
<td>6</td>
</tr>
<tr>
<td>Simulation</td>
<td></td>
</tr>
<tr>
<td>ZEIT3504</td>
<td>6</td>
</tr>
<tr>
<td>Aircraft and Systems Design 1</td>
<td></td>
</tr>
<tr>
<td>ZEIT4506</td>
<td>6</td>
</tr>
<tr>
<td>Orbital Mechanics</td>
<td></td>
</tr>
<tr>
<td>ZEIT4507</td>
<td>6</td>
</tr>
<tr>
<td>Space Situational Awareness</td>
<td></td>
</tr>
</tbody>
</table>

**General Education**

Students must take at least 12 UOC of the following courses, normally taken in the third or fourth year of study.

One of the following:
- ZGEN2222 | 6 UOC
  Introduction to Strategic Studies

- ZGEN2801 | 6 UOC
Strategy, Management and Leadership

One of the following:
ZGEN2215  |  6 UOC
Law, Force and Legitimacy

ZGEN2240  |  6 UOC
Introduction to Military Ethics

**Practical Experience**

Before graduation a student shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

**Level 4 Maturity Requirements**

Students may not attempt to undertake Level 4 courses until they have successfully completed 102 UOC of their engineering program (excluding General Education courses).

**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.
Related Programs

Related Double Degree Programs

Bachelor of Engineering (Honours) - BE (Hons)
Bachelor of Science - BSc

4482 Electrical Engineering (Honours) / Science

Faculty: UNSW Canberra at ADFA
Campus: Canberra
Units of Credit: 240
Typical Duration: 5 Years
Admission Requirements

Special Admission Requirements

Additional selection criteria for admission to this program:

- Other

Minimum ATAR or equivalent of 85 or above and successful selection by the Defence Force Recruiting organisation to be a trainee officer in one of the three ADF services for trainee officers or minimum ATAR for civilian students.

For more information about admission requirements for various UNSW programs, visit the following website(s):

Domestic Students
International Student
Program Requirements

Internships and Placements

Practical Experience Requirements

Before graduation a candidate shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

ADF Service Training and Practical Experience Requirements

Service training conducted during the degree program is recognised as partially satisfying practical experience requirements in the following ways:

Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW Canberra at ADFA is not eligible for consideration.)

Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.

Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.
Professional Outcomes

Accreditations

Professional institutes that offer accreditation on completion of this program:

- Engineers Australia

This degree is accredited by Engineers Australia, 2015, and has been recognised by the Institute of Electrical and Electronics Engineers.

Career Opportunities

The Electrical Engineer in the Navy is known as a WEO – a Weapons Electrical Officer, and is responsible for electronic systems associated with gun and missile control systems, navigation systems, air and ground communications, radar and sonar systems and data systems. WEOs are not only responsible for technical matters but are a vital link in management: they may become involved also in personnel, financial and resource management.

RAAF Electrical Engineers usually are employed to manage a wide variety of operations including the repair and maintenance of modern radar, navigation, communications and computing equipment. They may be posted to a squadron in charge of an avionics section, or to a development area working on technical problems associated with new equipment. As they gain experience they can be expected to be posted to one of the commands, usually as a project officer concerned with the management and funding of projects.

Army Electrical Engineers usually pursue a career either in the Royal Australian Corps of Signals or the Royal Australian Corps of Electrical and Mechanical Engineers. New graduates may be involved in such areas as the operation, management and repair of state-of-the-art communications equipment or the management of guided weapons systems, laser designation and range finding equipment and radar.
Recognition of Achievement

University Medal

The University Medal is awarded to recognise outstanding academic performance by a bachelor degree student in line with the University Medal Policy and University Medal Procedure.

Honours Classes

The degree of Bachelor of Engineering (Honours) in Electrical Engineering shall be conferred as a Bachelor Honours degree at Level 8 in the AQF. Honours in recognition of meritorious performance may be awarded in the following categories:

- Honours Class 1: Honours WAM of at least 80.0 and Thesis Mark of at least 65
- Honours Class 2 Division 1: Honours WAM of at least 75.0 and Thesis Mark of at least 65
- Honours Class 2 Division 2: Honours WAM of at least 65.0 and Thesis Mark of at least 65

Where candidates do not achieve Honours Class I or II, the Class of Honours is not displayed.

Courses will be weighted according to the following:

- Foundation ie Level 2 and 3 courses: 1
- Disciplinary ie Level 4 courses (not including final year projects): 2
- Thesis ie. Final Year projects: 3
**Program Fees**

At UNSW fees are generally charged at course level and therefore dependent upon individual enrolment and other factors such as student's residency status. For generic information on fees and additional expenses of UNSW programs, click on one of the following:

- Domestic Students
- Commonwealth Supported Students
- International Students
Pre-2019 Handbook Editions

Access past handbook editions (2018 and prior)

Pre-2019 Handbook Editions