ANU College of Engineering & Computer Science

POSTGRADUATE GUIDE

2019
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ENGINEERING & COMPUTER SCIENCE AT ANU

Australia’s leading university

Be recognised with an in-demand qualification from Australia’s top university.

At the ANU College of Engineering and Computer Science, you will study at a leading centre for research and education in Australia. The College is at the cutting edge of numerous fields including:

- logic
- algorithms and data
- signal processing
- artificial intelligence
- computer vision and robotics
- computational mechanics
- materials fabrication
- big software systems
- energy
- networked systems
- quantum cybernetics.

Join our community of students, teachers and researchers committed to finding sustainable solutions to the world’s greatest challenges. In return, receive education, research training and real-world experience that ensures you have a comprehensive understanding of a range of interconnected disciplines when you graduate.

You will benefit from a dynamic and pioneering research environment where you will learn in small classes, working alongside teachers who are some of the world’s brightest researchers.

Our researchers collaborate with an extensive network of academic, government and industry partners around Australia, in Europe, across the Asia-Pacific and the United States.

We’re currently working with Ford Motor Company and The Boeing Company to lighten, strengthen, and improve the sustainability of their vehicles and planes.

Our large-scale computational research is supporting product development at some of the largest global tech companies, including Microsoft Research, Facebook, Google, Intel, IBM and Oracle.

You will have opportunities to connect with these partners through a range of activities.
#1 in Australia
ANU is ranked #1 in Australia and #20 in the world.¹

Student figures
8,860 Postgraduate Coursework, 2,945 Higher Degree Research, 10,691 Undergraduate.

1:10 staff/student ratio
Best staff to student ratio of all Australian universities.

Best city to visit
Lonely Planet has ranked Canberra the World’s #3 best city to visit in 2018.

‘Well above’ world standard
95 per cent of ANU research is rated ‘above’ or ‘well above’ world standard.

1:10 staff/student ratio
Best staff to student ratio of all Australian universities.

Six Nobel Laureates
The highest number of all Australian universities.

¹ QS World University Rankings 2017/18.
Across the world, demand for engineering and computer science graduates is escalating in industry, business and government.

The impact of technology has been powerful and far-reaching and its practitioners have changed our world.

Modern engineers and computer scientists play an integral role in meeting the grand challenges of our time, including climate change, humanitarian crisis and protecting our natural resources.

Thanks to competitive salaries and exciting opportunities, professionals working in these fields report some of the highest levels of job satisfaction globally (Engineers Australia, 2012).

A postgraduate program in engineering or computing will reward you while you study, and long after. You will be challenged, placed at the forefront of technological innovation, and have the opportunity to develop transferable skills that can be applied in a range of professional contexts.

The job market is continually changing. Traditional vocations are disappearing or transforming, while new jobs are emerging in response to contemporary needs. Studying engineering or computing will provide you with skills and attributes that will remain relevant and keep you competitive in the evolving job market.

Future-proof yourself with a postgraduate program in engineering or computing.

We maintain partnerships and collaborations with institutions across the world and in Australia. These partnerships span from international renowned universities, industry leaders and humanitarian organisations. These connections greatly benefit our education and research whilst allowing us to contribute back to the community.

“...
Professor Elanor Huntington
Dean, ANU College of Engineering and Computer Science.
#1
International outlook
Ranked #1 in Australia and #7 in the world for international outlook.¹

Only
ANU is the only Australian university to consistently receive the highest ranking for research in Artificial Intelligence & Image Processing, & Information & Computing Sciences over the past five years.²

IARU
ANU is the only Australian member of the International Alliance of Research Universities.³

Super Computer
ANU is home to Raijin, Australia’s largest and most powerful university based super-computer.

Graduate salary
Five star maximum ratings for five assessment criteria including graduate starting salary.⁴

World Largest
We own the world’s largest paraboloidal dish solar concentrator, 500m² in size.

## OUR POSTGRADUATE PROGRAMS

*Our postgraduate programs allow you to study part time if you are a domestic student.*

<table>
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<th>Program</th>
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<th>International Application</th>
<th>Duration (Full-time)*</th>
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<tr>
<td>Graduate Diploma of Applied Data Analytics</td>
<td>UAC</td>
<td>NA</td>
<td>1 year</td>
</tr>
<tr>
<td>Master of Applied Data Analytics</td>
<td>UAC</td>
<td>Direct to ANU</td>
<td>1.5 years</td>
</tr>
<tr>
<td>Graduate Diploma of Computing</td>
<td>UAC</td>
<td>Direct to ANU</td>
<td>1 year</td>
</tr>
<tr>
<td>Master of Computing</td>
<td>UAC</td>
<td>Direct to ANU</td>
<td>2 years</td>
</tr>
<tr>
<td>Master of Computing (Advanced)</td>
<td>UAC</td>
<td>Direct to ANU</td>
<td>2 years</td>
</tr>
<tr>
<td>Graduate Diploma of Cyber Security, Strategy and Risk Management</td>
<td>UAC</td>
<td>NA</td>
<td>1 year</td>
</tr>
<tr>
<td>Masters of Cyber Security, Strategy and Risk Management</td>
<td>UAC</td>
<td>NA</td>
<td>1.5 years</td>
</tr>
<tr>
<td>Master of Engineering in Digital Systems and Telecommunications</td>
<td>UAC</td>
<td>Direct to ANU</td>
<td>2 years</td>
</tr>
<tr>
<td>Master of Engineering in Mechatronics</td>
<td>UAC</td>
<td>Direct to ANU</td>
<td>2 years</td>
</tr>
<tr>
<td>Master of Engineering in Photnics</td>
<td>UAC</td>
<td>Direct to ANU</td>
<td>2 years</td>
</tr>
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<td>Master of Engineering in Renewable Energy</td>
<td>UAC</td>
<td>Direct to ANU</td>
<td>2 years</td>
</tr>
<tr>
<td>Master of Innovation and Professional Practice</td>
<td>UAC</td>
<td>Direct to ANU</td>
<td>2 years</td>
</tr>
<tr>
<td>Master of Philosophy (MPhil)</td>
<td>Direct to ANU</td>
<td>Direct to ANU</td>
<td>2 years</td>
</tr>
<tr>
<td>Doctor of Philosophy (PhD)</td>
<td>Direct to ANU</td>
<td>Direct to ANU</td>
<td>4 years</td>
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OUR STUDENTS

Jonathan Ward
Master of Engineering in Photonics
Originally from Utah in the United States, Jonathan completed a Bachelor degree at Portland State University and spent a year living in China teaching English before pursuing his Masters.

“Having completed my undergraduate degree at a different university, I had courses with 200-300 other students. At ANU, even general education classes are dramatically smaller. This makes it easy to get time with the professors when extra help is needed.”

Sandra Arcos-Holzinger
Master of Engineering in Digital Systems and Telecommunications
Originally from South America, Ecuador, Sandra Arcos-Holzinger transferred from the University of Miami to complete her Bachelor of Engineering at ANU. Now she’s completing her Master of Engineering in Digital Systems and Telecommunications, and hopes to continue towards a PhD.

“I am always exposed to the mindset of renowned professors and academics who are constantly contributing to the students’ learning experience.”

Cheng Yu
Master of Computing
Born in Shanghai, China, Cheng Yu is an entrepreneurial Masters student whose time in Silicon Valley has inspired him to develop Artificial Intelligence for the benefit of people.

“It’s quite mind-blowing; many of the theories I’ve learnt in class are two decades ahead of our time, and are taught by leading researchers in the field.”
The ANU Research School of Engineering is a creative mix of staff and students that embrace the breadth of engineering professions from materials science, energy systems research all the way to research into fabrication technology. The culture of the School is highly interdisciplinary and dynamic, leading to internationally recognised research and educational activities. We are research intensive and our research areas include: Acoustics and Audio, Biomaterials, Communications, Composite Materials, Computational Mechanics, Computer Vision, Energy Storage, Manufacturing Systems, Micro- and Nano-Scale Systems, Nanomaterials, Networked systems, Quantum Cybernetics, Optical Devices, Photovoltaics, Robotics, Sensors, Signal Processing, and Solar Thermal.

The research intensive nature of the School lends itself to a strong cohort of higher degree research students and project students completing innovative work. The small and highly integrated nature of the School means that we provide a dynamic and cross disciplinary research environment in which we incubate new areas of research contributing to the growth of new disciplines and new technology.

The School has built an extensive network of international collaborations with research institutions and industries in Europe, the Asia Pacific and the United States. Several spinoffs from the School, such as Seeing Machines, are now highly successful companies. Key technology developed within the School, such as the Big Dish, provide flagship infrastructure for Australian industry and academia.
MASTER OF ENGINEERING IN MECHATRONICS

The aim of this two-year program is to provide students with specialised knowledge and professional engineering skills to prepare them for a career in the rapidly-growing fields of mechatronics, robotics and automation, computer vision and intelligent systems. The program builds on ANU interdisciplinary engineering focus and research expertise to give students the required skills to address complex multi-disciplinary problems, while at the same time providing advanced technical knowledge in the above fields.

The program includes specialised courses in control systems, computer vision, robotics, embedded systems, and data analytics. Students also have the opportunity to select electives from across the University.

Graduates will have the skills and knowledge to:

> apply systematic engineering methods to address complex, multi-disciplinary real-world engineering problems related to robotics and mechatronic systems.
> apply advanced, integrated technical knowledge in mechatronics and the underpinning sciences and scientific methods.
> identify and critically evaluate current developments and emerging trends within the robotics, intelligent systems, and industry automation sector.
> understand the contextual factors that influence professional engineering practice, and identify the potential societal, ethical, and environmental impact of engineering activities.
> communicate effectively with colleagues, other engineering professionals and the broader community employing a range of communication tools.
> engage in independent investigation, critical reflection and lifelong learning to continue to practice at the forefront of the discipline.
> work effectively and proactively within cross-cultural, multi-disciplinary teams, demonstrating autonomy, ethical conduct, expert judgement, adaptability and responsibility to achieve engineering outcomes at a high standard.

Entry Requirements

A Bachelor of Engineering, Bachelor of Engineering with Honours or international equivalent with a minimum GPA of 5/7 and a minimum of 1 course in computer programming.

All applicants must meet the University’s English Language Admission Requirements for Students.

Cognate disciplines

Electrical and Electronics Engineering, Automation and Intelligent Systems, Information Engineering, and Computer Science and Engineering.

Credit Exemption/Status

Eligible students may be awarded up to one year (50 per cent) of status (credit). This may include students:

> who have completed a Masters in Engineering
> who have a High Distinction average (or equivalent) in a Bachelor degree in Engineering
> who have a Distinction average in an ANU Bachelor of Engineering
> with an appropriate combination of relevant work experience and qualification.

Degree Structure

The Master of Engineering in Mechatronics requires the completion of 96 units, which must consist of:

54 units from completion of the following compulsory courses:

> ENGN6250 Professional Practice 1
> ENGN8260 Professional Practice 2
> ENGN8100 Introduction to Systems Engineering
> ENGN8120 Systems Modelling
> ENGN8170 Group Project
> ENGN6213 Digital Systems and Microprocessors
> ENGN6223 Control Systems
> ENGN6627 Robotics

A minimum of 6 units from completion of technical group 1 courses from the following list:

> ENGN6528 Computer Vision
> COMP6710 Structured Programming
> COMP6730 Programming for Scientists
> ENGN6224 Fluid Mechanics and Heat Transfer
> ENGN6331 Systems Dynamics

A minimum of 24 units from completion of technical group 2 courses from the following list:

> ENGN8535 Engineering Data Analytics
> ENGN8536 Advanced Topics in Mechatronics Systems
> ENGN8537 Embedded Systems and Real Time Digital Signal Processing
> ENGN8538 Probability and Stochastic Processes in Engineering
> ENGN8831 Integration of Renewable Energy into Power Systems and Microgrids
> ENGN8833 Industrial Energy Efficiency and Decarbonisation
> ENGN8224 Advanced Control Systems

A maximum of 12 units from completion of elective courses offered by ANU

Elective options include the possibility for students to complete an industry-based internship, or an individual research project, subject to availability and individual academic performance.
The aim of this two-year program is to provide students with specialised knowledge and professional engineering skills to prepare them for a career in the rapidly-growing field of photonics and optoelectronics. Photonics professionals work across a wide range of industries including research and development, telecommunications, sensing and remote detection and biomedical diagnostics. This program builds on ANU interdisciplinary engineering focus and research expertise to give students the required skills to address complex multi-disciplinary problems, while at the same time providing advanced technical knowledge in photonics.

The program includes specialised courses in optical physics, fibre optic communications, optical sensing, biophotonics, optical instrumentation for astronomy, and photovoltaics. Students also have the opportunity to select electives from across the University.

**Graduates will have the skills and knowledge to:**

- apply systematic engineering methods to address complex, multi-disciplinary real-world engineering problems related to photonic and optoelectronic systems.
- apply advanced, integrated technical knowledge in photonics and the underpinning sciences and scientific methods.
- identify and critically evaluate current developments and emerging trends within the photonics sector.
- understand the contextual factors that influence professional engineering practice, and identify the potential societal, ethical, and environmental impact of engineering activities.
- communicate effectively with colleagues, other engineering professionals and the broader community employing a range of communication tools.
- engage in independent investigation, critical reflection and lifelong learning to continue to practice at the forefront of the discipline.
- work effectively and proactively within cross-cultural, multi-disciplinary teams, demonstrating autonomy, ethical conduct, expert judgement, adaptability and responsibility to achieve engineering outcomes at a high standard.

**Entry Requirements**

A Bachelor degree or international equivalent in a cognate discipline with a minimum GPA of 5/7.

All applicants must meet the University’s English Language Admission Requirements for Students.

**Cognate disciplines**

Electrical Engineering, Electronic Engineering, Optoelectronic Engineering, Physics.

**Credit Exemption/Status**

Eligible students may be awarded up to one year (50 per cent) of status (credit). This may include students:

- who have completed a Masters in Engineering
- who have a High Distinction average (or equivalent) in a Bachelor degree in Engineering
- who have a Distinction average in an ANU Bachelor of Engineering
- with an appropriate combination of relevant work experience and qualification.

**Degree Structure**

The Master of Engineering in Photonics requires the completion of 96 units, which must consist of:

78 units from completion of the following compulsory courses:

- ENGN6250 Professional Practice 1
- ENGN6512 Optical Physics
- ENGN6513 Fibre Optics Communication Systems
- ENGN6613 Photonic Sensing Systems
- ENGN8100 Introduction to Systems Engineering
- ENGN8120 Systems Modelling
- ENGN8260 Professional Practice 2
- PHYS8014 Photonics in Biotechnology and Nanotechnology
- PHYS8015 Photonics Laboratory
- PHYS8016 Photonics Advanced Topics
- PHYS8017 Integrated Optics and Optoelectronics
- PHYS8170 Research Project in Photonics

A minimum of 6 units from completion of courses from the following list:

- ENGN6334 Semiconductors
- ENGN6524 Photovoltaic Technologies
- ENGN6626 Digital Communications
- PHYS3035 Fourier Systems and Optics

A maximum of 12 units from completion of elective courses offered by ANU

Elective options include the possibility for students to complete an industry-based internship, or an individual research project, subject to availability and individual academic performance.
This two-year program will provide students with specialised knowledge and professional engineering skills to prepare them for a career in information engineering which is at the heart of modern digital systems. The program builds on ANU interdisciplinary engineering focus and research expertise to give students the skills to address complex multi-disciplinary problems, while at the same time providing advanced technical knowledge in digital systems and telecommunications engineering.

The program includes specialised courses in signal processing, engineering statistics, wireless communications, embedded systems and information theory. Students also have the opportunity to select electives from across the University, or to extend their technical knowledge into related areas such as computer networking, data analytics, computer vision and robotics.

Graduates will have the skills and knowledge to:

- apply systematic engineering methods to address complex, multi-disciplinary real-world engineering problems related to modern digital systems and telecommunications.
- apply advanced, integrated technical knowledge in digital systems and telecommunications engineering and the underpinning sciences and scientific methods.
- identify and critically evaluate current developments and emerging trends within the digital systems and telecommunications sector.
- understand the contextual factors that influence professional engineering practice, and identify the potential societal, ethical, and environmental impact of engineering activities.
- communicate effectively with colleagues, other engineering professionals and the broader community employing a range of communication media and tools.
- engage in independent investigation, critical reflection and lifelong learning to continue to practice at the forefront of the discipline.
- work effectively and proactively within cross-cultural, multi-disciplinary teams, demonstrating autonomy, ethical conduct, expert judgement, adaptability and responsibility to achieve engineering outcomes at a high standard.

Entry Requirements

A Bachelor of Engineering, Bachelor of Engineering with Honours or international equivalent with a minimum GPA of 5/7 and a minimum of 1 course in Digital Communications or Digital Systems.

All applicants must meet the University’s English Language Admission Requirements for Students.

Cognate disciplines


Credit Exemption/Status

Eligible students may be awarded up to one year (50 per cent) of status credit. This may include students:

- who have completed a Masters in Engineering
- who have a High Distinction average (or equivalent) in a Bachelor degree in Engineering
- who have a Distinction average in an ANU Bachelor of Engineering
- with an appropriate combination of relevant work experience and qualification.

Degree Structure

The Master of Engineering in Digital Systems and Telecommunications requires the completion of 96 units, which must consist of:

- 78 units from completion of the following compulsory courses:
  - ENGN6213 Digital Systems and Microprocessors
  - ENGN6250 Professional Practice 1
  - ENGN6536 Wireless Communications
  - ENGN6537 Discrete-Time Signal Processing
  - ENGN8100 Introduction to Systems Engineering
  - ENGN8120 Systems Modelling
  - ENGN8170 Group Project
  - ENGN8260 Professional Practice 2
  - ENGN8534 Information Theory
  - ENGN8537 Embedded Systems and Real Time Digital Signal Processing
  - ENGN8538 Probability and Stochastic Processes in Engineering
  - ENGN8637 Advanced Topics in Communications and Signal Processing

- A minimum of 6 units from completion of courses from the following list:
  - ENGN6513 Fibre Optics Communication Systems
  - ENGN6625 Power Electronics

A maximum of 12 units from completion of elective courses offered by ANU

Elective options include the possibility for students to complete an industry-based internship, or an individual research project, subject to availability and individual academic performance.
This two-year program will provide students with specialised knowledge and engineering skills to prepare them for a career in the rapidly-growing renewable energy industry. The program builds on ANU interdisciplinary engineering focus and research expertise to give students the skills to address complex multi-disciplinary problems, while at the same time providing advanced technical knowledge in renewable energy.

The program includes specialised courses in solar, wind and other renewable technologies, utility-scale systems design, grid integration and energy efficiency. Students also have the opportunity to select electives from across the University, including courses in the complementary areas of energy policy, law and economics.

Graduates will have the skills and knowledge to:

- apply systematic engineering methods to address complex, multi-disciplinary real-world engineering problems related to generation, transmission and utilization of renewable energy.
- apply advanced, integrated technical knowledge in renewable energy and the underpinning sciences and scientific methods.
- identify and critically evaluate current developments and emerging trends within the renewable energy sector.
- contextualise renewable technology projects within a local, national and international framework, and consider social, ethical and environmental impacts and consequences.
- communicate effectively with colleagues, other engineering professionals and the broader community employing a range of communication media and tools.
- engage in independent investigation, critical reflection and lifelong learning to continue to practice at the forefront of the discipline.
- work effectively and proactively within cross-cultural, multi-disciplinary teams, demonstrating autonomy, ethical conduct, expert judgement, adaptability and responsibility to achieve engineering outcomes at a high standard.

Entry Requirements

A Bachelor of Engineering, Bachelor of Engineering with Honours or international equivalent with a minimum GPA of 5/7.

All applicants must meet the University’s English Language Admission Requirements for Students.

Cognate disciplines


Credit Exemption/Status

Eligible students may be awarded up to one year (50 per cent) of status (credit). This may include students:

- who have completed a Masters in Engineering
- who have a high distinction average (or equivalent) in a Bachelor Degree of Engineering
- who have a distinction average in an ANU Bachelor of Engineering
- with an appropriate combination of relevant work experience and qualification.

Degree Structure

The Master of Engineering in Renewable Energy requires the completion of 96 units, which must consist of:

72 units from completion of the following compulsory courses:

- ENGN6250 Professional Practice 1
- ENGN8260 Professional Practice 2
- ENGN8100 Introduction to Systems Engineering
- ENGN8120 Systems Modelling
- ENGN8170 Group Project
- ENGN6524 Photovoltaic Technologies
- ENGN6516 Energy Resources and Renewable Technologies
- ENGN8830 Photovoltaic Power Plants
- ENGN8831 Integration of Renewable Energy into Power Systems and Microgrids
- ENGN8832 Urban Energy and Energy Efficiency
- ENGN8833 Industrial Energy Efficiency and Decarbonisation

A minimum of 12 units from completion of courses from the following list:

- ENGN6224 Fluid Mechanics and Heat Transfer
- ENGN6334 Semiconductors
- ENGN6525 Solar Thermal Technologies
- PHYS6301 Wind Energy

A maximum of 12 units from completion of elective courses offered by ANU

Elective options include the possibility for students to complete an industry-based internship, or an individual research project, subject to availability and individual academic performance.

More than 50% of new electricity capacity installed globally in 2016 was renewable. Our program provides the skills to be at the forefront of this energy revolution, which already employs more than 8 million people worldwide

Associate Professor Tom White
Educational programs in our school focus on the disciplines of computer science, computing, information technology and software engineering for undergraduates, postgraduate coursework, and postgraduate research students. They emphasise foundations, creativity, design and engineering processes. Our graduates are widely recognised as solid professionals who are able to drive innovation in industry and government. Our students regularly win industry awards for their excellent work.

Our research groups and research activities traverse many of the layers of computing technology and computer science. They range from studies of the foundations of algorithms, logic and artificial intelligence to the building of programming-language support systems and new interfaces for computer human interaction. Our researchers have excellent international reputations and collaborate with the best people in the world in their areas. Our location at ANU facilitates multidisciplinary interaction with outstanding researchers throughout the college and university. We currently have research collaboration with Data61.
The Graduate Diploma of Computing is a one-year full-time (or equivalent part-time) degree for graduates from any discipline who wish to up-skill, or for computing graduates who wish to refresh and enhance existing computing skills in the shortest time possible. The Graduate Diploma of Computing provides its graduates with a pathway into the IT industry or to more advanced study in the computing discipline.

The Graduate Diploma of Computing provides graduates with a strong foundational knowledge and skills in problem solving, programming and the mathematics required to continue with more advanced study in the computing discipline or to acquire and develop entry level skills and knowledge. The program provides students with the opportunity to investigate a wide range of specialist areas which can be used as the basis for further study or for a new career involving computing.

**Entry Requirements**

A Bachelor degree with a GPA of 4 (high pass average), or an Advanced Diploma or Associate Degree with three years' work experience in a relevant domain may be admitted on a case-by-case basis.

All applicants must meet the University's English Language Admission Requirements for Students.

**Credit Exemption/Status**

Applicants with a Bachelor degree that includes formal programming courses and who have received a grade of over 65% or greater in an ANU Bachelor degree or equivalent may receive exemption for:

- COMP6710 Introduction to Software Systems

Applicants with a Bachelor degree that includes an equivalent mathematics course and who have received a grade of over 65% or greater in an ANU Bachelor degree or equivalent may receive exemption for:

- MATH6005 Discrete Mathematical Models

Applicants with professional work experience may receive exemption for:

- COMP6250 Professional Practice 1

**Degree Structure**

The Graduate Diploma of Computing requires the completion of 48 units, which must consist of:

- 24 units from completion of the following compulsory courses:
  - COMP6710 Introduction to Software Systems
  - MATH6005 Discrete Mathematical Models
  - COMP6250 Professional Practice 1
  - COMP6442 Software Construction

Completion of a further 24 units of 6000 – 8000-series COMP computer science courses.

**Transfer to the Master of Computing**

Students completing the Graduate Diploma of Computing with a GPA of 5 or above may be granted up to 48 units of credit into the Master of Computing (MCOMP). When planning to transfer to the MCOMP on completion, students will need to take care selecting their elective courses to allow for maximum credit and a smooth transition into the MCOMP. For advice, please book an appointment with the Program Convenor.

Elective course examples:

- COMP6240 Relational Databases
- COMP6120 Software Engineering
- COMP6260 Foundations of Computing
- COMP6261 Information Theory
- COMP6262 Logic
- COMP6300 Introduction to Computer Systems
- COMP6310 Concurrent and Distributed Systems
- COMP6340 Networked Information Systems
- COMP6390 HCI and Usability Engineering
- COMP6466 Algorithms
- COMP6720 Art and Interaction in New Media
- COMP6780 Web Development & Design
The Master of Computing is a two-year full-time (or equivalent part-time) degree with two target audiences: graduates without a computing background who wish to acquire a solid knowledge of computing, and graduates with a computing or information technology background who wish to broaden and deepen, or refresh their knowledge. The program is professionally accredited by the Australian Computer Society.

Graduates will develop a deep knowledge and understanding of professional software development and computing practices. Students have the opportunity to participate in many cutting-edge courses and, depending upon their background and interests, may choose to specialise in artificial intelligence, human centred design and software development, or data science.

The program culminates in a capstone project: either working in small groups as part of the University's innovative TechLauncher program with industry partners, researchers, or in start-ups; or by undertaking a small research project supervised by an academic.

On completion of 48 units, students may choose to exit with a Graduate Diploma of Computing.

Students completing the Master of Computing with a GPA greater than 6 may transfer to the Master of Computing (Advanced) with up to 48 units of credit.

### Entry Requirements

A Bachelor degree with a GPA of 5 (high credit average), or at least 3 years’ work experience in a relevant domain and a Bachelor degree with a GPA of less than 5 but greater than 4 may be admitted on a case by case basis.

All applicants must meet the University’s English Language Admission Requirements for Students.

### Credit Exemption/Status

Students with a Computing or Information Technology Bachelor Degree or Graduate Diploma may receive up to 48 units of credit allowing them to complete the program in less than the usual 2-year time frame.

Applicants with a Bachelor degree or Graduate Diploma that includes formal programming courses for which they have received 65% or greater in an ANU Bachelor degree or equivalent may receive credit or exemption for:

- COMP6710 Introduction to Software Systems

Applicants with a Bachelor degree or Graduate Diploma that includes an equivalent mathematics course for which they have received 65% or greater may in an ANU Bachelor degree or equivalent receive credit exemption for:

- MATH6005 Discrete Mathematical Models

Applicants with professional work experience may receive credit or exemption for:

- COMP6250 Professional Practice I

Those applicants with significant professional and managerial experience may receive credit or exemption for:

- COMP8260 Professional Practice II

Credit for other courses will be handled on a case-by-case basis.

### Degree Structure

The Master of Computing requires the completion of 96 units, of which a minimum of 36 units must come from completion of 8000-level courses in the subject area COMP Computer Science. The 96 units must consist of:

- 36 units from completion of the following compulsory courses:
  - COMP6710 Introduction to Software Systems
  - COMP6442 Software Construction
  - COMP6250 Professional Practice 1
  - COMP8260 Professional Practice 2
  - COMP8110 Managing Software Projects in a System Context
  - MATH6005 Discrete Mathematical Models

- 6 units from one of the following courses:
  - COMP6120 Software Engineering; or
  - COMP8190 Model-Driven Software Development

- 6 units from one of the following courses:
  - COMP6240 Relational databases; or
  - COMP6420 Introduction to Data Management, Analysis and Security

- 6 units from one of the following courses:
  - COMP6340 Networked Information Systems; or
  - COMP6331 Computer Networks

- 12 units from one of the following courses:
  - COMP8715 Computing Project; or
  - COMP8755 Individual Computing Project; or COMP8830 Computer Science Internship. This is usually taken in the student's 3rd semester but may sometimes be taken in their final semester

- 30 units from completion of additional COMP courses including at least 12 units of 8000 series courses.

Students may choose to use 24 units to complete one of the following specialisations:

- Artificial Intelligence
- Data Science
- Human Centred Design and Software Development

### Computing Project

The computing project is completed in the student’s final year of study as a capstone experience and may be completed as an individual research project (COMP8755) or as a group project (COMP8715). COMP8715 is completed over the two final semesters as part of the University’s innovative TechLauncher program (cs.anu.edu.au/techlauncher). COMP8755 can be completed either over the final two semesters (6 units per semester) or in the student’s final semester (12 units).
The Master of Computing (Advanced) is a two-year full-time (or equivalent part-time) degree targeting students who wish to enter industry in an R&D or leadership role, or who wish to pursue a PhD.

Graduates of the Master of Computing (Advanced) will deepen their existing knowledge and understanding of professional software development and computing practices. Students have the opportunity to participate in many cutting-edge courses and, depending upon their background and interests, are likely to choose to specialise in artificial intelligence, human centred design and software development, or data science. The program culminates in a capstone individual research project requiring students to complete a substantial research thesis.

Specialisations are currently available in

- Artificial Intelligence
- Data Science
- Human-Centred Design and Software Development

Entry Requirements

A Bachelor degree in a cognate area with a GPA of 6 (solid distinction average) or above, or at least 3 years’ work experience in a relevant domain and a Bachelor degree in a cognate area with a GPA of less than 6 but greater than 5 may be admitted on a case-by-case basis.

Cognate areas include Computer Science and Software Engineering. Prospective students with other computing degrees, such as Information Technology or Science (with a major in computing), will be considered on a case-by-case basis.

All applicants must meet the University’s English Language Admission Requirements for Students.

Credit Exemption/Status

Students may be awarded up to 48 units of credit. The number of units of credit a student receives will be determined on a case-by-case basis and will be influenced by their background and focus of their earlier studies.

Degree Structure

The Master of Computing (Advanced) requires the completion of 96 units, of which a minimum of 48 units must come from completion of 8000-level courses in the subject area COMP Computer Science.

The 96 units must consist of:

- 36 units from completion of the following compulsory courses:
  - COMP6442 Software Construction
  - COMP8260 Professional Practice 2
  - COMP6445 Computing Research Methods
  - COMP6331 Computer Networks
  - COMP6420 Introduction to Data Management, Analysis and Security
  - COMP6120 Software Engineering
- 24 units from completion of
  - COMP8800 Research Project
- 36 units from completion of additional COMP courses, including at least 24 units of 8000 series courses.

Students may choose to use 24 units to complete one of the following specialisations:

- Artificial Intelligence
- Data Science
- Human-Centred Design and Software Development

Unless otherwise stated, a course used to satisfy the requirements of one specialisation may not be double counted towards satisfying the requirements of another specialisation.

NOTE:
To remain enrolled in the Master of Computing (Advanced) students must achieve a minimum GPA of 6 in the first 48 units and have the approval of a supervisor for the research project. Students who fail to achieve the required minimum GPA or who do not have the approval of an identified supervisor will be transferred to the Master of Computing with 48 units of credit.

Computing Project

The computing project is completed in the student’s final year of study as a capstone experience. This is a substantial piece of individual research conducted under the supervision of an academic. It is completed over two semesters (12 units each semester) and requires submission of a formal research report as well as two presentation seminars. Prior to undertaking their research project, students are required to complete COMP6445 Computing Research Methods, which introduces them to the fundamentals of research methodologies suitable for application in the computing domain.
If a student has space within their program, they may choose to complete a specialisation consisting of 24 units from the list of courses for that specialisation.

**Artificial Intelligence**

The Artificial Intelligence specialisation offers courses on a wide range of relevant topics. Depending on the chosen courses, students will learn about AI search, optimisation, reasoning, planning, diagnosis, machine learning, intelligent agents (reinforcement learning, information-theoretic foundations), data-driven approaches (matching and modelling), and bio-inspired computing (neural networks, and evolutionary algorithms).

A maximum of 12 units may come from completion of courses from the following list:

- COMP6260 Foundations of Computing
- COMP6262 Logic
- COMP6320 Artificial Intelligence

A minimum of 12 units must come from completion of courses from the following list:

- COMP8420 Bio-Inspired Computing: Applications and Interfaces
- COMP8600 Introduction to Statistical Machine Learning
- COMP8620 Advanced Topics in Artificial Intelligence
- COMP8650 Advanced Topics in Statistical Machine Learning
- COMP8670 Advanced Topics in Logic & Computation
- ENGN6528 Computer Vision

**Data Science**

Data Science combines the fields of computer science, statistics and applied mathematics, and visualisation. Using automated analysis methods, data science, extracts information and insights from massive quantities of both structured and unstructured data. The specialisation includes courses in areas such as database systems, data mining, document analysis, artificial intelligence and machine learning.

18 units from completion of the following compulsory courses:

- COMP8410 Data Mining
- COMP8430 Data Wrangling
- COMP6490 Document Analysis

And 6 units from completion of one of the following courses:

- COMP6320 Artificial Intelligence
- COMP8420 Bio Inspired Computing: Applications and Interfaces
- COMP8600 Introduction to Statistical Machine Learning
- COMP8620 Advanced Topics in Artificial Intelligence
- COMP8650 Advanced Topics in Statistical Machine Learning

**Human-Centred Design and Software Development**

The goal of human-centred software development is to produce software products that are designed and developed around the users’ needs and requirements from the very beginning of the development process. “Human-centred design is a creative approach to interactive systems development that aims to make systems usable and useful by focusing on the users, designing around their needs and requirements at all stages, and by applying human factors/ergonomics, usability knowledge, and techniques. This approach enhances effectiveness and efficiency, improves human well-being, user satisfaction, accessibility and sustainability; and counteracts possible adverse effects of use on human health, safety and performance.”

This specialisation includes courses in the human-computer interface design, software engineering processes and interdisciplinary courses on complex systems.

A minimum of 12 units must come from 8000 level courses.

A maximum of 12 units may come from completion of courses from the following list:

- COMP6353 Systems Engineering for Software Engineers
- COMP6390 HCI and Usability Engineering
- COMP6461 Computer Graphics

A minimum of 12 units must come from completion of courses from the following list:

- COMP8100 Requirements Elicitation & Analysis Techniques
- COMP8173 Software Engineering Processes
- COMP8190 Model-Driven Software Development
- COMP8420 Bio-Inspired Computing Applications & Interfaces
- VCPG6001 Unravelling Complexity
- VCPG6004 Creating Impact
- VCPG8001 Wicked Problems
GRADUATE DIPLOMA OF CYBER SECURITY, STRATEGY AND RISK MANAGEMENT

<table>
<thead>
<tr>
<th>Academic Plan: DCSRSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration: 1 year full-time</td>
</tr>
<tr>
<td>Minimum: 48 units</td>
</tr>
<tr>
<td>CRICOS Code: TBA</td>
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<tr>
<td>UAC Code: NA</td>
</tr>
</tbody>
</table>

Summary
The Graduate Diploma of Cyber Security, Strategy and Risk Management is a 1 year full-time (or equivalent part-time) degree that provides students with:

> Exposure to best practice in cyber security, strategy and risk management.
> Cutting edge courses in areas of relevance to cyber security, strategy and risk management.
> An opportunity to deepen knowledge in areas including computing and national security policy, among others.
> Professional development for leaders and practitioners.
> The opportunity to undertake research of professional relevance.

The program will be taught in intensive blended mode with students expected to be enrolled part-time.

This is a new program and is not available for international students.

Pathways
The Graduate Diploma in Cyber Security, Strategy and Risk Management will be an entry and exit pathway for the Master of Cyber Security, Strategy and Risk Management (proposed).

Graduates will have the skills and knowledge to:

> Develop and apply effective cyber security strategies, provide leadership direction for an organization to best prepare itself for operations in a contested environment.
> Assess the role policy plays in engineering secure systems, technology for policy implementation, and the role of policy in driving the composition of cyber security solutions.
> Compare and contrast the legal and ethical aspects of cyber security at the national and international level.
> Negotiate the legal, social, regulatory, ethical, and technical issues related to securing information systems and critical infrastructures.
> Demonstrate awareness of and responses to a diverse range of cyber threats.

Entry requirements
A Bachelor’s degree with Honours or international equivalent, with a GPA of at least 4/7 in any discipline from a recognised university or
A Bachelor’s degree or international equivalent with a GPA of at least 4/7 in any discipline from a recognised university plus 1 year of relevant work experience or
A Bachelor’s degree or international equivalent with a GPA of at least 5/7

Applicants who have completed a degree in a cognate discipline from a recognised university may be eligible to receive coursework credit towards this degree, in line with the ANU Graduate Coursework Award Rules.

Cognate disciplines
Engineering, Maths, Physics, Chemistry, Biology, Statistics, Finance, Actuarial Studies, Computer Science, Information Technology, Criminology, Sociology, Law, Management, Economics, Political Science, Psychology, Epidemiology/Public Health, Anthropology

Credit Exemption/Status
Applicants who have completed a degree in a cognate discipline from a recognised university may be eligible to receive coursework credit towards this degree, in line with the ANU Graduate Coursework Award Rules.

Degree structure
The Graduate Diploma of Cyber Security, Strategy and Risk Management requires completion of 48 units, which must consist of:

42 units from the following compulsory courses:

> COMP6301: Computing Foundations for Cyber Security
> COMP6340: Networked Information Systems
> COMP6420: Data Management, Analysis, and Security
> LAWS8077: Cyber Law
> NSPO8006: National Security and Policymaking
> NSPO8021: Statecraft and National Security in Cyberspace
> MGMT7203: Risk Analysis

6 units from completion of one of the following courses:

> CRIM8002: Cyber Crime
> MGMT8005: Project Risk and Issues Management
Summary
The Master of Cyber Security, Strategy and Risk Management is a 1.5 year full-time (or equivalent part-time) degree that provides students with:

- Exposure to best practice in cyber security, strategy and risk management.
- Cutting edge courses in areas of relevance to cyber security, strategy and risk management.
- An opportunity to deepen knowledge in areas including computing and national security policy, among others.
- Professional development for leaders and practitioners.
- The opportunity to undertake research of professional relevance.

The program will be taught in intensive blended mode with students expected to be enrolled part-time.

This is a new program and is not available for international students.

Graduates will have the skills and knowledge to:

- Develop and apply effective cyber security strategies, provide leadership direction for an organization to best prepare itself for operations in a contested environment.
- Assess the role policy plays in engineering secure systems, technology for policy implementation, and the role of policy in driving the composition of cyber security solutions.
- Compare and contrast the legal and ethical aspects of cyber security at the national and international level.
- Integrate acquired knowledge in cyber security to propose solutions for real world problems.
- Negotiate the legal, social, regulatory, ethical, and technical issues related to securing information systems and critical infrastructures.
- Monitor, direct, and enhance the protection of cyber systems through widely accepted standards, procedures and policies.
- Assess vulnerability of existing and proposed ICT systems.
- Manage for cyber security risks, focusing on decision making, trade-offs, requirements building, team building, and leading.
- Demonstrate awareness of and responses to a diverse range of cyber threats.

Entry requirements
A Bachelor’s degree with Honours or international equivalent, with a GPA of at least 5/7 in any discipline from a recognised university or

A Bachelor’s degree or international equivalent with a GPA of at least 5/7 in any discipline from a recognised university plus 3 years of relevant work experience.

Applicants who have completed a degree in a cognate discipline from a recognised university may be eligible to receive coursework credit towards this degree, in line with the ANU Graduate Coursework Award Rules.

Cognate disciplines
Engineering, Maths, Physics, Chemistry, Biology, Statistics, Finance, Actuarial Studies, Computer Science, Information Technology, Criminology, Sociology, Law, Management, Economics, Political Science, Psychology, Epidemiology/Public Health, Anthropology

Credit Exemption/Status
Applicants who have completed a degree in a cognate discipline from a recognised university may be eligible to receive coursework credit towards this degree, in line with the ANU Graduate Coursework Award Rules.

Degree structure
The Master of Cyber Security, Strategy and Risk Management requires completion of 72 units, which must consist of:

60 units from the following compulsory courses:

- COMP6301: Computing Foundations for Cyber Security
- COMP6340: Networked Information Systems
- COMP6420: Data Management, Analysis, and Security
- COMP7500: Software Security
- LAWS8077: Cyber Law
- CRIM8002: Cyber Crime
- NSPO8006: National Security and Policymaking
- NSPO8021: Statecraft and National Security in Cyberspace
- MGMT7203: Risk Analysis
- MGMT8005: Project Risk and Issues Management

12 units from completion of either:

**Computer Science Pathway:**

- COMP8501: Defensive Cyber Security Operations
- COMP8502: Offensive Cyber Security Operations

**Strategy and Policy Pathway:**

- NSPO8014: Ethics and Technology of War
- NSPO8017: Malicious Networks: Transnational Terrorism and Crime
Interested in developing skills or upskilling in the area of data analytics?

These programs are designed to address a global shortage of graduates with skills in data analytics, which is vital to the development of high-quality, data-informed decision-making. The program has wide-ranging applications for the Australian government, Australian businesses and the broader community, all of which are facing the challenge of how to use public data effectively and informatively.

The rapid expansion of the digital environment has increased the opportunity for data-driven innovation, but also the dangers of it. Being able to understand and anticipate developments in the manipulation and use of data will result in a workforce with a diverse skillset that ranges over computational, statistical and methodological approaches.

These areas of expertise can be applied in a range of professional settings, from public health to national security, to education and consumer industry.

The data analytics program focuses on equipping students to apply their skills in solving problems that reflect 'real' conditions, as well as giving students familiarity with the underlying principles of 'big data' software systems. Real-world case studies are embedded in several key courses spread throughout the curriculum.

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**GRADUATE DIPLOMA OF APPLIED DATA ANALYTICS**

**Academic Plan:** DADAN  
**Duration:** 1 year full-time  
**Minimum:** 48 units  
**CRICOS Code:** No CRICOS  
**UAC Code:** 830813

The Graduate Diploma is intended for students who:

- wish to acquire a broad skills base in applied data analytics covering computing, social science and statistical topics;
- wish to undertake cutting edge courses in areas of relevance to data analytics practitioners;
- wish to start a postgraduate qualification after one year of relevant work experience.

**Admission requirements**

Either: A Bachelor degree with Honours or international equivalent with a GPA of 4 in any discipline from a recognised university

Or: A completed Bachelor degree or international equivalent with a GPA of 4 plus 1 year of relevant work experience

**Graduate Certificate of Applied Data Analytics**

The Graduate Certificate is available as an early exit option for students who do not wish to pursue further study in the Master or Graduate Diploma programs.

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**Graduate Diploma Degree Requirements**

The Graduate Diploma of Applied Data Analytics requires the completion of 48 units, which must consist of:

- 30 units from completion of the following compulsory courses:
  - COMP8410 Data Mining
  - SOCR8201 Introduction to Social Science Methods and Types of Data
  - SOCR8202 Using Data to Answer Policy Questions and Evaluate Policy
  - STAT6039 Principles of Mathematical Statistics
  - STAT7055 Introductory Statistics for Business and Finance

- 6 units from completion of courses from the following list:
  - COMP6240 Relational Databases
  - COMP7240 Introduction to Database Concepts
  - COMP1040 The Craft of Computing
  - COMP6730 Programming for Scientists

- 6 units from completion of courses from the following list:
  - STAT6038 Regression Modelling
  - STAT7001 Applied Statistics

---

**POSTGRADUATE PROGRAMS IN**

**Applied Data Analytics**

ANO College of Engineering and Computer Science
At the Australian Institute of Health and Welfare it is abundantly clear that high level capability in data management and data analytics across the organisation is key to meeting our objectives.

Our people, and their skills, is our capability.

Good data is the foundation and infrastructure for good policy and good services. The right data at the right time is needed to guide the development of the policy or the service and to assist with the measurement of outcomes.

Barry Sandison
Director (CEO)
Australian Institute of Health & Welfare

" 

MAST ER OF APPLIED DATA ANALYTICS

Academic Plan: MADAN
Duration: 1.5 years full-time
Minimum: 72 units
CRICOS Code: 097058B
UAC Code: 830812

Admission requirements
Either: A Bachelor degree with Honours or international equivalent with a GPA of 5 in any discipline from a recognised university.
Or: A completed Bachelor degree or international equivalent with a GPA of 5 plus 3 years of relevant work experience.
Applicants who have completed a degree in a cognate discipline may be eligible to receive credit in line with the ANU Graduate Coursework Award Rules towards their Master of Applied Data Analytics degree.

Degree Requirements
The Master of Applied Data Analytics requires the completion of 72 units, which must consist of:
6 units from completion of the following compulsory courses:
> COMP8410 Data Mining
> COMP8430 Data Wrangling
> SOCR8201 Introduction to Social Science Methods and Types of Data
> SOCR8202 Using Data to Answer Policy Questions and Evaluate Policy
> STAT6039 Principles of Mathematical Statistics
> STAT7026 Graphical Data Analysis
> STAT7055 Introductory Statistics for Business and Finance
12 units from completion of courses from any of the following lists:
Computer Science
> COMP6490 Document Analysis
> COMP8420 Bio-inspired Computing: Applications and Interfaces
> COMP8600 Introduction to Statistical Machine Learning
Social Science
> SOCR8082 Social Research Practice
> SOCR8006 Online Research Methods
> SOCR8203 Advanced Techniques in the Creation of Social Science Data
> SOCR8204 Advanced Social Science Approaches to Inform Policy Development and Service Delivery
> Statistical Data Analysis
> STAT7016 Introduction to Bayesian Data Analysis
> STAT7030 Generalised Linear Models
> STAT7040 Statistical Learning
> STAT8002 Applied Time Series Analysis
“The Innovation and Professional Practice courses are for people from any discipline who want to change the world. Tackle complex, real-world challenges with world-leading researchers and experts from business, government, and the broader community.”

Dr Shayne Flint
Program Convener
Master of Innovation and Professional Practice

MASTER OF INNOVATION AND PROFESSIONAL PRACTICE

Academic Plan: MINPP
Duration: 2 years full-time
CRICOS Code: 092938K
Minimum: 96 units
UAC Code: 830830

This two year program builds upon ANU Vice Chancellor’s courses to prepare students from all disciplines with the knowledge, skills and confidence required to achieve great things in our uncertain, but exciting world of rapid technological, economic, environmental and social change.

The program is multidisciplinary in enrollment, content and teaching, and provides students with extensive opportunities to learn by working in multidisciplinary teams on complex real-world challenges and opportunities with business, the innovation ecosystem, government, NGOs and the broader community.

Students will complement their disciplinary specific undergraduate studies by working across fields to develop knowledge and competencies required of future workers including design thinking, systems thinking, dealing with complexity and uncertainty, creativity, entrepreneurship, innovation, leadership and teamwork.

Over the course of their final year, students will undertake a significant group project. They will work with business, government, NGOs and other organisations on wicked problems and opportunities of local, national and global significance.

Highly motivated students will be given an opportunity to engage with the ACT start-up community to create their own start-up enterprises.

Degree Requirements

24 units from completion of the following introductory graduate coursework component:
- MGMT8015 Entrepreneurship and Innovation
- VCPG6001 Unravelling Complexity
- VCPG6004 Creating Impact
- A research methods course

36 units from completion of the following compulsory courses:
- MGMT7161 Entrepreneurship and New Venture Planning
- VCPG6002 Mobilising Research
- VCPG6100 Group Research and Innovation Project (12 units)
- VCPG6001 Wicked Problems
- VCPG8002 Ignorance!

12 units from completion of breadth courses from the following list:
- VCPG6200 Innovation Internship (6-12 units)
- Any 8000-level course offered by an ANU college

24 units from elective courses offered by ANU.
MEET WITH US

The best way to get a feel for ANU is to come and experience it first-hand.

Open Day
Open day is the best way to experience life at ANU. Our accommodation, study and research, recreational and sporting facilities will all be on show for you to explore. Academics, professional staff and students from across ANU will be on hand to speak with you in-person about your postgraduate study options. Bring friends and family with you to discover our campus from 9am-4pm on the last Saturday in August.

Online Events
Find out about our online information sessions and events for students at cecs.anu.edu.au/events

Campus Tours
Take a tour guided by a Student Ambassador who will share with you their experience at ANU while showing you around our beautiful campus. Tours operate Monday to Friday 10am-5pm (excluding public holidays).

For more information

W anu.edu.au/campustours
To book

E campus.tours@anu.edu.au
You can undertake a research program at ANU through a Doctor of Philosophy (PhD) or a Masters of Philosophy (MPhil). The major component of research program is a substantial written work or thesis, which investigates a particular subject or issue. As a research student you will work with increased independence, under the direction of a supervisory panel of academic staff.

**Doctor of Philosophy**

The Doctor of Philosophy award will take you between three and four years to complete full time. This award is conducted in English and is made principally on the basis of a research thesis compromising original written work, typically up to 100,000 words. Your thesis will be independently assessed by at least two external examiners of international standing.

You are most likely to gain admission to a Doctor of Philosophy program if you hold a Master of Philosophy or a Bachelor degree with First Class Honours. You may also be granted admission if you can demonstrate that you have a background equivalent to these qualifications.

W [programsandcourses.anu.edu.au/program/9000XPHD](http://programsandcourses.anu.edu.au/program/9000XPHD)

**Master of Philosophy**

The Master of Philosophy award will take you between one and two years to complete full time. This award is conducted in English and is made principally on the basis of a research thesis compromising original written work, typically up to 60,000 words.

You are most likely to gain admission to a Master of Philosophy program if you hold a Bachelor degree with First Class Honours. You may also be granted admission if you can demonstrate that you have a background equivalent to these qualifications.

W [programsandcourses.anu.edu.au/program/8000XMPHIL](http://programsandcourses.anu.edu.au/program/8000XMPHIL)

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**How to apply**

1. Go to [cecs.anu.edu.au/study/graduate-research](http://cecs.anu.edu.au/study/graduate-research)
2. Complete the self assessment tool to determine your eligibility to do research at ANU.
3. Complete the pre-application process and identify a research group and supervisor.
4. Complete a formal application either online or through an agent representative.

**You’ll need:**

- CV
- Transcripts
- Three referee reports
- Statement of support from your potential supervisor
- Thesis proposal - written with your supervisor
- Proof of meeting English language requirements

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Google is a fast-paced environment which requires you to be really good at communicating. Having a rich social life at ANU, being involved in clubs and working in team environments has differentiated me from graduates of other universities.

**Dr Jess Tsimeris**

User Experience (UX) Research Assistant, Google PhD in Computer Science 2015 at ANU
RESEARCH THEMES

Our world class academics and students conduct research in a number of areas across seven research themes.

Engineering

Energy
- Energy Storage
- Photovoltaics
- Solar Thermal

Fabrication
- Manufacturing
- Micro & Nano Systems
- Optical Devices
- Sensors

Information
- Acoustics & Audio
- Communications
- Computer Vision
- Networked Systems
- Quantum Cybernetics
- Robotics
- Signal Processing

Materials
- Biomaterials
- Composite Materials
- Computational Mechanics
- Nanomaterials

Computer Science

Intelligence
- Data Mining & Matching
- Intelligent Agents
- Knowledge Representation & Reasoning
- Machine Learning
- Planning & Optimisation

Systems
- High Performance Computing
- Human-Centred Computing
- Programming Languages, Design & Implementation
- Software Engineering

Theory
- Algorithms
- Databases
- Logic
WHERE WILL YOUR ANU DEGREE TAKE YOU?

Careers in engineering and computer science are diverse and as an ANU graduate, a wide range of opportunities are available to you.

**Graduate salary**
Five star maximum ratings for five assessment criteria including graduate starting salary.¹

**International outlook**
Ranked #1 in Australia and #7 in the world for international outlook.²

**Most employable graduates**
Ranked #1 in Australia, and #21 in the world for Graduate Employability.³

$76K
Average full-time starting salary for an ANU postgraduate.⁴

83%
Full-time employed graduates say ‘qualification’ is important in their employment.⁵

58%
ANU Graduates employed full-time in the public sector.⁶

### Companies that employ our graduates

#### Engineering
- Accenture
- AECOM
- AEMO
- Airservices Australia
- Amazon
- Arup
- Aurecon
- Australian Government
- BHP Billiton
- Boeing
- BP
- Brookfield Multiplex
- Energy Australia
- Ericsson
- Google Inc
- Honeywell
- IBM
- KPMG
- Motorola
- Northrop Consulting
- Origin Energy
- PwC
- Telstra
- Thales Australia
- Toyota Australia
- WSP

#### Computer Science
- Alcatel-Lucent
- Amazon
- Apple inc.
- BAE Systems
- CEA Technologies Pty Ltd
- Citadel Systems
- Civil Aviation Safety Authority
- Codarra Advanced Systems
- Deloitte
- Dematic
- Dolby
- Fujitsu
- Genentech
- Google Inc.
- Hewlett Packard
- Huawei
- IBM
- Microsoft
- Motorola
- Nova Systems
- Oracle Corporation
- Optiver
- Seeing Machines
- Telstra
- ThoughtWorks
- Visa

MEET OUR ALUMNI

Our graduates are located all over the world, in diverse and exciting roles.

Samuel Fernandes
Program Manager, Berkeley Laboratory, University of California
Master of Systems Engineering (Renewable Energy) 2011
Samuel Fernandes’ interest in renewable energy has taken him from Mumbai to Australia and now to America.
After his graduating, Samuel joined the ranks of ANU staff, bringing his enthusiasm for renewable energy to roles with the ANU Space Management Team and the ANU Energy and Sustainability Office.
Samuel has recently moved to the US to work in the Research and Development laboratory at the University of Berkeley, California, but ANU still holds fond memories and valuable contacts for him.

“I have a world class university education, the prestige of the finest University in Australia and the reputation of ANU in the renewable energy space.
I am still in touch with teachers and other friends I have met throughout the university, not just from Engineering.”

Dr Elena Kelareva
Product Manager, Google
PhD in Computer Science 2014
ANU graduate, Dr Elena Kelareva is a Product Manager at Google and the mastermind behind the Google Maps that appear on thousands of websites.
While studying at ANU Elena received the NASSCOM Student Innovation Award for IT-Enabled Business Innovation and a NITCA PhD Scholarship.
In 2012 Elena secured a Software Engineer Internship at Google where she implemented a new feature for the Android app for Google Drive.
Five years later, Elena is now a Product Manager at Google where she works on Google Maps APIs.

“Compared to other universities, ANU has a reputation of having high quality computer science education and from a PhD perspective in particular, computer science research.”
HOW TO APPLY

Apply today to take the first step towards a postgraduate qualification.

**Domestic Students**

You are a domestic applicant if you:
> are an Australian or New Zealand citizen
> hold an Australian Permanent Residency Visa
> hold an Australian Humanitarian Visa.

If none of these criteria apply, then you are an international student.

You can apply for a postgraduate coursework program if you hold a Bachelor degree or are about to graduate. Some programs will require you to demonstrate a certain academic average, such as a credit or distinction average.

All applicants must meet the University’s English Language Requirements.

**How to apply**

To apply for most postgraduate coursework degree programs, you will need to submit your application through the Universities Admissions Centre (UAC) and pay a fee.

W uac.edu.au

**How to accept your offer**

You can accept your offer to study at ANU online at anu.edu.au/study/accept

**Important dates**

As a guide, Semester One applications close in early January and Semester Two applications close at the end of May. Always check application deadlines on the UAC website.

W uac.edu.au/postgraduate

**International Students**

**How to apply**

International students can apply directly to ANU, or through an official ANU agent.

**Applying online**

You can apply online at anu.edu.au/study/apply

Check that you meet the admission and English language requirements for your chosen course. You will need to pay a A$100.00 application fee.

ANU will assess your application and we may contact you if we need more information.

If your application is successful, you will receive a Full Offer or a Conditional Offer, depending on any further requirements.

**Apply through an official ANU agent**

ANU has official agents in over 50 countries around the world. ANU agents will help you with all aspects of your application – from answering your questions and helping you select the right program for your needs, to submitting and processing your application.

**To find an official ANU agent**

W anu.edu.au/study/contacts

<table>
<thead>
<tr>
<th>Important dates</th>
<th>Semester 1 (February)</th>
<th>Semester 2 (July)</th>
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<tr>
<td>Application closing dates</td>
<td>15 December</td>
<td>31 May</td>
</tr>
<tr>
<td>Acceptance deadline (offshore students)*</td>
<td>15 January</td>
<td>30 June</td>
</tr>
<tr>
<td>Acceptance deadline (onshore students)**</td>
<td>31 January</td>
<td>10 July</td>
</tr>
</tbody>
</table>

*The term “offshore student” ordinarily applies to you if you have not completed your entry qualification in Australia under an Australian student visa, and will be applying for a student visa from overseas.

** The term “onshore student” ordinarily applies to you if you have completed your entry qualification in Australia under an Australian student visa and you are applying for ANU and your new student visa without a break in your study (e.g. you may be going home for a short holiday after your previous studies, but you will be coming back to start at ANU in the next intake).
FEES & SCHOLARSHIPS

Tuition fees and other costs vary for domestic and international postgraduate students.

Domestic Students
Most domestic postgraduate coursework and non-award students at ANU pay domestic tuition fees. The amount you have to pay is based on the courses that you enrol in. Each course has a set fee, so you will be invoiced for the total fees for all the courses you enrol in for a semester or session.

You can defer part or all of your tuition fees using FEE-HELP if you meet these citizenship and residency requirements:
>
  - You are an Australian citizen or permanent humanitarian visa holder (living in Australia for the duration of your enrolment).
  - You are a permanent visa holder undertaking bridging study for overseas-trained professionals, and will be living in Australia for the duration of your enrolment. If you use FEE-HELP, the Australian Government will pay your tuition fees while you study, but you will be required to pay back those fees through the taxation system or voluntary payments.

For more information on FEE-HELP go to the Australian Government website studyassist.gov.au/sites/studyassist/helppayingmyfees/fee-help/pages/fee-help-

A small number of postgraduate programs offer Commonwealth Supported Places (CSP) where the Australian Government subsidises your tuition fees.

W  cecs.anu.edu.au/study/commonwealth-supported-places

International Students
If you are an international student, you will have to pay international student fees. The amount you have to pay is based on the courses that you enrol in. Each course has a set fee, so you will be invoiced for the total fees for all the courses you enrol in for a semester or session.

Refund policy for international students
If you are an international student and have enrolled at ANU for the first time and you are in your first semester or session, your tuition fees may be refunded in full if you discontinue your studies.

For more information on this policy go to anu.edu.au/pg/fees

Health insurance
All international citizens living in Australia must have health insurance.

Overseas Student Health Cover (OSHC) is private health insurance that will cover the costs of your medical and hospital care if you need it. We recommend OSHC Worldcare but you can choose another provider that offers this cover.

Cost of Living
In addition to tuition fees, there are other costs you may want to consider before starting your postgraduate degree at ANU, particularly if you’re moving to Canberra from interstate or overseas.

The ACT Government website Canberra: Create your Future explores a range of topics about living, studying and working in Canberra, including living costs.

W  canberrayourfuture.com.au

For international students, the Australian Government’s Study in Australia website is also full of useful information about studying in Australia.

W  studyinaustralia.gov.au

Services and Amenities Fee
Domestic and international students at ANU must pay a services and amenities fee. This helps to support services like student counselling, recreational facilities, sporting and cultural events held on campus throughout the year.

W  anu.edu.au/pg/ssaf

Scholarships
ANU offers a range of scholarships for students undertaking Postgraduate degrees. Please note that in addition to scholarships offered by ANU, there are funding support opportunities offered by Australian and overseas governments, and other industry partners and affiliates that you can take advantage of.

W  anu.edu.au/students/scholarships-support
ANU is in the heart of Canberra, Australia’s capital. It’s a thriving city set within a classic Australian bush landscape.

**Best student city**
QS Best Student Cities 2016 has ranked Canberra in the top 20 cities in the world to live and study.

**High income**
Canberra enjoys Australia’s highest average weekly income at $1,702.10

**Global community**
A city of just over 390,000 people, countless embassies and national institutes, Canberra has a strong sense of community; our global community.

**National institutions**
As the capital, Canberra is home to the National Library, Parliament, High Court, numerous museums and embassies.

**Commute**
Canberra offers the smallest commute times in Australia, extensive bike paths and discounts on public transport.

**Road trip?**
Canberra is very well situated between Sydney (three hours drive), the ocean (two hours drive) and the ski fields (two hours drive).

**Safest**
Canberra is considered one of the safest cities in Australia with one of the lowest crime rates.

**Capital**
Canberra is the best place in Australia to experience events of national importance such as Australia Day or high-level visits from world leaders.

**Four seasons**
Canberra boasts long sunny days, with an average of 7.4 hours of sunlight and all four seasons of the year.
If you want to make friends for life and get involved in extra-curricular activities ANU is the right place for you.

**Campus life**
The combination of guaranteed accommodation and only one campus makes campus life vibrant.

**Feel safe**
Canberra has one of the lowest crime rates in Australia. If you feel unsafe ANU has a bus to take you home.

**Student city**
Canberra is a student city with the highest student population ratio in Australia.

**Libraries**
At ANU you have access to six different libraries, with over 2.5 million physical items, and 63 million electronic resources.

**Hungry?**
ANU has over 35 shops, restaurants and cafes. It also has bank, post office and a gym.

**Close to the city**
The ANU Campus is only 100 steps to the Canberra CBD, and 150 steps to the lake.

**Student clubs**
Over 200 student clubs! Get involved in music, film, sport, debating, Harry Potter or perhaps the Chocolate Appreciation Club?

**Associations**
Engineering and Computer Science both have very active student associations with game nights, barbeques and more.

**Student initiatives**
Our students are involved in a variety of initiatives such as Robogals, Engineers Without Borders and start-ups.
Live on campus or take a short commute from one of Canberra’s well-connected neighbourhood.

**On-campus accommodation**

ANU gives you more opportunities to live on campus than any other Australian university, so you can make the most of your time here. Apply to join nearly 5,000 students from across Australia and around the world who call ANU home.

Postgraduate students can apply for on-campus accommodation in these residences:

- Self-catered
  - Burgman College Postgraduate Village
  - Davey Lodge
  - Fenner Hall
  - Graduate House
  - Kinloch Lodge
  - Lena Karmel Lodge
  - Toad Hall
  - Warrumbul Lodge

- Semi-catered*
  - Bruce Hall Packard Wing
  - Ursula Hall Laurus Wing

*semi-catered includes one meal each week.

We cannot guarantee that on-campus accommodation will be available. Also, student residences are not suitable for children, so you may need to explore renting off-campus (non-ANU).

If you have children, we recommend arriving in Canberra early to find non-ANU accommodation.

**Share a house or apartment**

Shared accommodation can be hard to find if you’re not in Canberra.

Shared households in Australia take different forms; some share meals and rotate household chores, while others have multiple people living in the same house but keeping separate lives.

A good place to start looking for shared accommodation is ANU Housing Online.

W housingonline.anu.edu.au

**Rent privately**

You can rent an apartment or house privately through a real estate agent or direct from the property owner.

The best place to start your search is online. We recommend these sites.

W allhomes.com.au

W domain.com.au

W realestate.com.au

W gumtree.com.au

Because Canberra is a university town, the highest turnover of rental properties is during the December/January summer break.

**Applying for a lease**

In Canberra, real estate agents and property owners often insist that prospective tenants see the property before applying for a lease, to be seriously considered.

To apply you will need to fill out an application form which will ask you about your personal circumstances, including your financial situation. You will also be asked for referees, people who can verify that you are a trustworthy, like a previous landlord or employer.

If you are applying from overseas, it’s a good idea to attach written references to your application. Given the time differences between Australia and the rest of the world, this will make the process easier for you and the person assessing your application.

The agent will let you know within a day or two if your application has been successful.

**Setting up your home**

Your lease will usually be for a period of six to 12 months. Factor in these costs when setting up your new home.

Bond is usually four weeks’ rent and is held by the ACT Office of Regulatory Services. Provided you don’t cause damage to the property and maintain it, the bond will be returned to you in full at the end of the lease.

As well as bond, you will probably need to pay between two and four weeks’ rent in advance.

You will have to pay connection fees for the telephone, electricity, gas, and any other utilities you choose to connect to the property.

It’s a good idea to take out household contents insurance.

Moving expenses.

If you happen to have a dispute with the landlord or real estate agent, Accommodation Services and the Tenants Union ACT can give you advice and advocate on your behalf.

W anu.edu.au/study/accommodation

W tenantsact.org.au
ANU Careers Centre is dedicated to providing a range of services to assist you reach your full potential. From the general exploration of career ideas to details of specific jobs, employers, and advice on recruitment strategies, the ANU Careers Office offers a range of services to current and graduated students, including:

- resume and application advice
- interview preparation
- building employability and work experience
- job search strategies
- graduate recruitment processes
- host employer and career events

W anu.edu.au/careers

**Academic Skills and Learning Centre**

Academic Skills and Learning Centre (ASLC) offers ANU students of all levels free and confidential help with their academic work through individual tutorials, workshops, courses and handouts.

The centre inspires students to take control of their learning and teaches students a broad range of strategies to become active and confident learners who think critically, research effectively, communicate incisively and apply their learning with integrity.

- individual, confidential and free tutorials to enrolled ANU students
- design and teach academic skills and learning programs
- offer online learning resources
- design and present print and electronic materials
- maintain academic skills and learning resources.

W academskills.anu.edu.au

**The Postgraduate and Research Students’ Association**

The Postgraduate and Research Students’ Association (PARSA) represents your interests and looks out for your welfare as a postgraduate student at ANU. Run by student representatives and professional staff, PARSA provides a range of free services and activities aimed at meeting the specific needs of postgraduate students in your studies and everyday life. Services include:

- academic advice
- Centrelink assistance
- financial assistance
- accommodation assistance
- legal assistance
- funding assistance.

For more information visit W parsa.anu.edu.au

**The ANU Sport and Recreation Association**

The ANU Sport and Recreation Association, commonly known as ANU Sport, promotes and provides a varied and exciting range of opportunities to participate in affordable sporting and physical recreational activities.

ANU Sport run lunchtime sporting competitions including indoor soccer, touch football, ultimate disc, volleyball and basketball.

For more information visit:

W anu-sport.com.au
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