UNSW AUSTRALIA

Civil and Environmental Engineering
Postgraduate coursework programs

Never Stand Still | Engineering | Civil and Environmental Engineering

SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING

EDUCATION FOR PROFESSIONALS

The School of Civil and Environmental Engineering has delivered cutting-edge postgraduate engineering programs for more than 60 years. With a focus on sustainability and essential core engineering knowledge, our programs are backed by leading research and filled with case studies and practice-based skills training.

- **STAFF WITH INTERNATIONAL REPUTATIONS** – Our staff are national leaders with international reputations in their areas of specialisation, with strong links to industry.
- **GLOBAL TOP 20 RANKING** – The School of Civil and Environmental Engineering is consistently ranked in the top 20 worldwide (QS Ranking 2012-2014).
- **STUDENTS WITH DIVERSE BACKGROUNDS** – Our students come from a range of industries and countries and include consultants, contractors, subcontractors, suppliers, private sector providers and government employees.
- **A VARIETY OF DELIVERY METHODS** – including one or a combination of face-to-face lectures, online, field-based and teaching blocks.

COURSEWORK PROGRAMS

- Civil Engineering
- Environmental Engineering
- Geospatial Engineering
- Geotechnical Engineering and Engineering Geology
- Project Management
- Structural Engineering
- Transport Engineering
- Water Engineering: catchments to coast
- Water, Wastewater and Waste Engineering.

PROGRAMS AVAILABLE

Our postgraduate coursework programs provide professional engineers with essential specialist knowledge, improved performance and enhanced career prospects. They also provide excellent opportunities for other professionals interested in advancing their understanding of engineering.

MASTER OF ENGINEERING SCIENCE

- **DESIGNED FOR:** The engineer with a four year honours degree (from a recognised institution) who wants to advance their career through specialising in a particular field.
- **SPECIALISATIONS:** Available in Civil Engineering, Environmental Engineering, Geospatial Engineering, Geotechnical Engineering and Engineering Geology, Project Management, Structural Engineering, Transport Engineering, Water Engineering: catchments to coast; and Water, Wastewater and Waste Engineering.

As well as the MEngSc program, students can opt for a Graduate Diploma or Graduate Certificate in Engineering Science if they don't qualify for entry or if they would like a taste of postgraduate education. Each program articulates into the next as long as the student performs well.

MASTER OF ENGINEERING

- **DESIGNED FOR:** The engineer with a three or four year degree who wants to advance their knowledge in engineering management, or a professional from another related discipline who wants to move into engineering.
- **SPECIALISATIONS:** Available in Civil Engineering and Environmental Engineering. Further details see p27-30.

MASTER OF ENGINEERING SCIENCE

THE DEGREE OF CHOICE FOR THE ENGINEERING PROFESSIONAL

The Engineering Science program at UNSW Engineering is designed especially for graduate engineers seeking to develop or enhance their careers through cross-training, re-training and specialisation. An extensive research component ensures every graduating student is equipped with the highest-level practical and analytical skills.

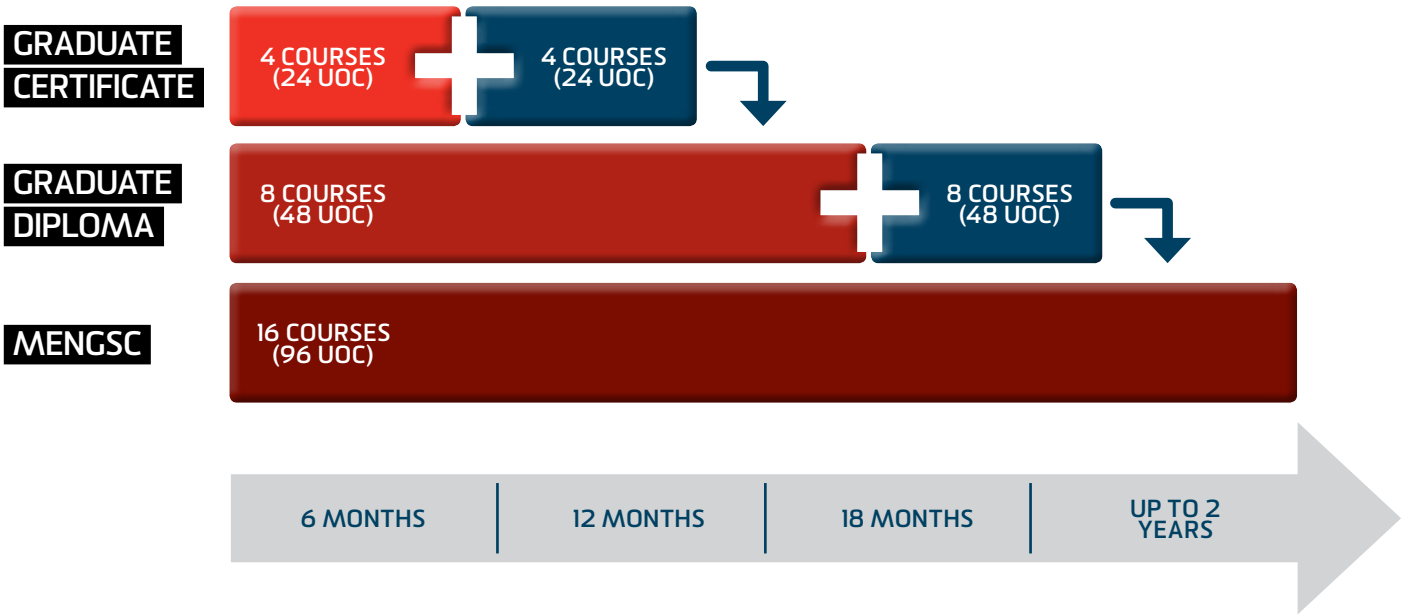
Eligible students can be exempted from up to eight courses (or 48 UOC) for Masters and up to four (or 24 UOC) for Graduate Diploma depending on previous study and professional experience. This can reduce the time taken by up to a year.

OUR PROGRAMS...

- **MENGSC:** This degree can take 1-2 years depending on previous study and experience. Open to engineering graduates with a four year Bachelor degree with honours (or credit average equivalent) in an appropriate area of engineering from a recognised university or those who have successfully completed the Graduate Diploma.
- **GRADUATE DIPLOMA:** This program can take 6-12 months depending on previous study and experience. Open to graduates with a three or four year degree in a relevant discipline of engineering or science plus relevant professional experience. The Graduate Diploma can provide a pathway to the MEngSc.
- **GRADUATE CERTIFICATE:** Open to graduates with a three or four year degree in a relevant discipline of engineering or science plus relevant professional experience. The Graduate Certificate is a pathway to the Graduate Diploma and then to the Masters.

... ASSEMBLE

If you don't qualify for direct entry into the Masters of Engineering Science, it is possible to progress from the Graduate Certificates and Graduate Diplomas. This option might also be suitable for you if you aren't sure whether Post Graduate study is right for you.



WHAT YOU WILL LEARN

Engineering Science is our flagship program. Our courses are rich with stimulating and comprehensive content that will inspire your learning and motivate you to move ahead into the next phase of your engineering future. The program consists of the following:

- **DISCIPLINARY KNOWLEDGE COURSES** – also known as Professional Development Courses, these are designed to develop core knowledge and skills in your chosen specialisation and prepare you for the Advanced Disciplinary Courses. If you are moving from a different discipline, these courses are particularly valuable.
- **ADVANCED DISCIPLINARY KNOWLEDGE COURSES** – these are the main courses of your chosen specialisation. Drill down to the intricate details of the specialisation, fostering deep analysis and problem solving skills that prepare you to really make a difference.
- **ELECTIVES** – flexible choices designed to let you tailor your studies to what you are most passionate about in engineering.
- **RESEARCH** - an essential part of your study to provide a greater depth of knowledge and understanding. Many Graduate Diplomas have an option of a smaller research component, and in some it is compulsory. Exemption may be granted in some circumstances.

Students who have not completed a four year degree which included a thesis must complete a 12 UOC Masters Thesis research component that gives them the opportunity to broaden their understanding of a topic that they are passionate about. The research will be supervised by an appropriate academic. All students must undertake GSOE9010 Engineering Postgraduate Coursework Research Essentials (6 UOC).

ENTRY REQUIREMENTS

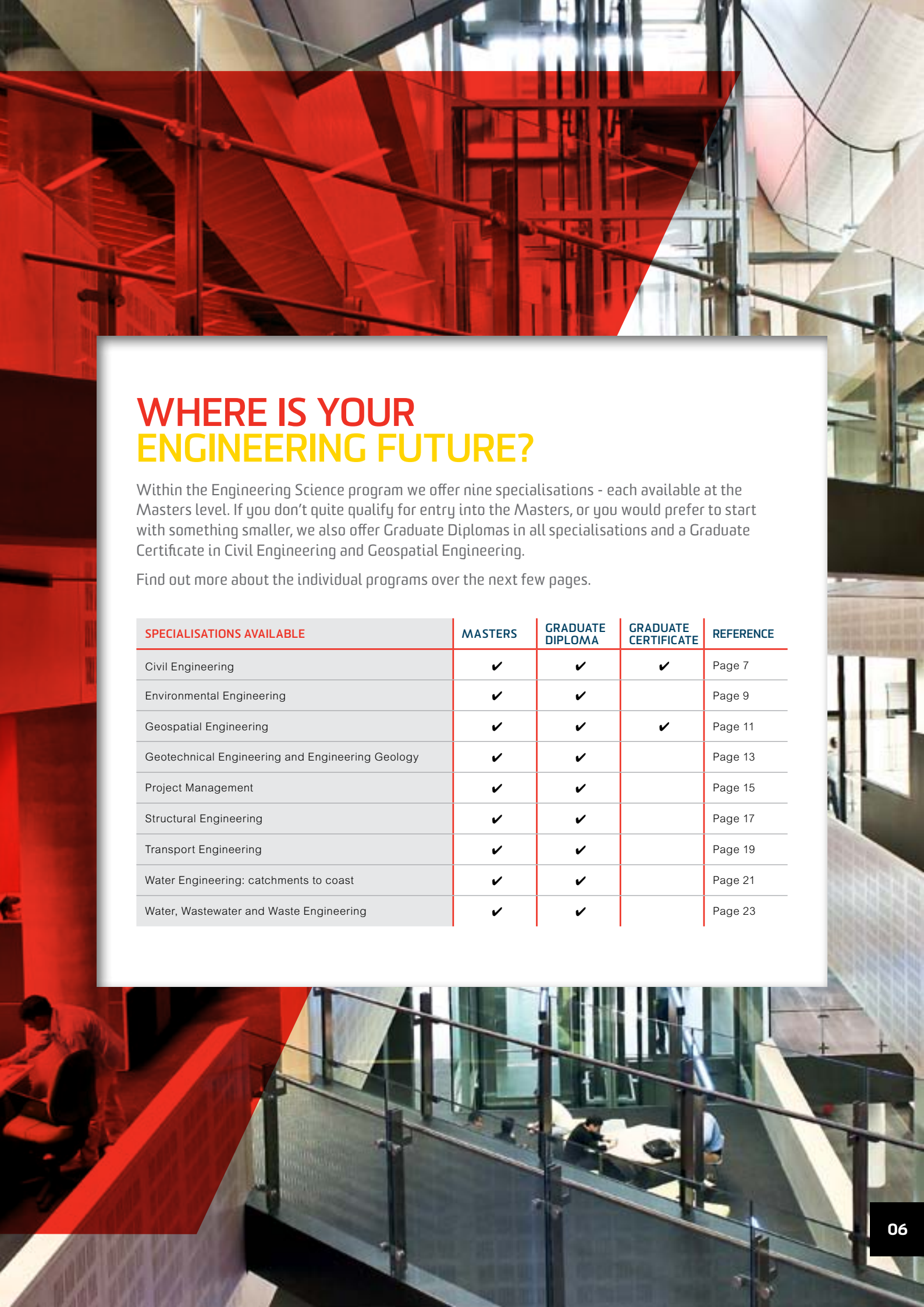
Masters: you need a recognised four year Bachelor degree in an appropriate area of engineering with at least Honours II/2 or equivalent or an average mark of at least 65% over the final two years. Graduate Diploma: you need a three or four year degree in a relevant discipline of engineering or science plus at least three years of relevant professional experience. The Graduate Diploma is a common pathway to the Masters.

EXEMPTIONS OR ADVANCED STANDING

Students may be granted credit for some courses. Those with a four year honours degree in Engineering can apply for credit for up to 48 UOC for the Masters (effectively reducing it to one year full time). Full details can be found on the program handbook page.

DELIVERY MODE

Face-to-face teaching is our strength, all part of our campus experience. Certain courses are offered in intensive short course mode and many are offered by distance to suit busy professionals.



WHERE IS YOUR ENGINEERING FUTURE?

Within the Engineering Science program we offer nine specialisations - each available at the Masters level. If you don't quite qualify for entry into the Masters, or you would prefer to start with something smaller, we also offer Graduate Diplomas in all specialisations and a Graduate Certificate in Civil Engineering and Geospatial Engineering.

Find out more about the individual programs over the next few pages.

SPECIALISATIONS AVAILABLE	MASTERS	GRADUATE DIPLOMA	GRADUATE CERTIFICATE	REFERENCE
Civil Engineering	✔	✔	✔	Page 7
Environmental Engineering	✔	✔		Page 9
Geospatial Engineering	✔	✔	✔	Page 11
Geotechnical Engineering and Engineering Geology	✔	✔		Page 13
Project Management	✔	✔		Page 15
Structural Engineering	✔	✔		Page 17
Transport Engineering	✔	✔		Page 19
Water Engineering: catchments to coast	✔	✔		Page 21
Water, Wastewater and Waste Engineering	✔	✔		Page 23

CIVIL ENGINEERING

Civil Engineering is one of the oldest and largest fields of engineering – and as the most broadly based engineering discipline there are many options for specialisation. Postgraduate education in Civil Engineering is a smart way to give yourself an advantage. By honing your knowledge and skills in a specialist area you can advance your career in the direction of your choice.

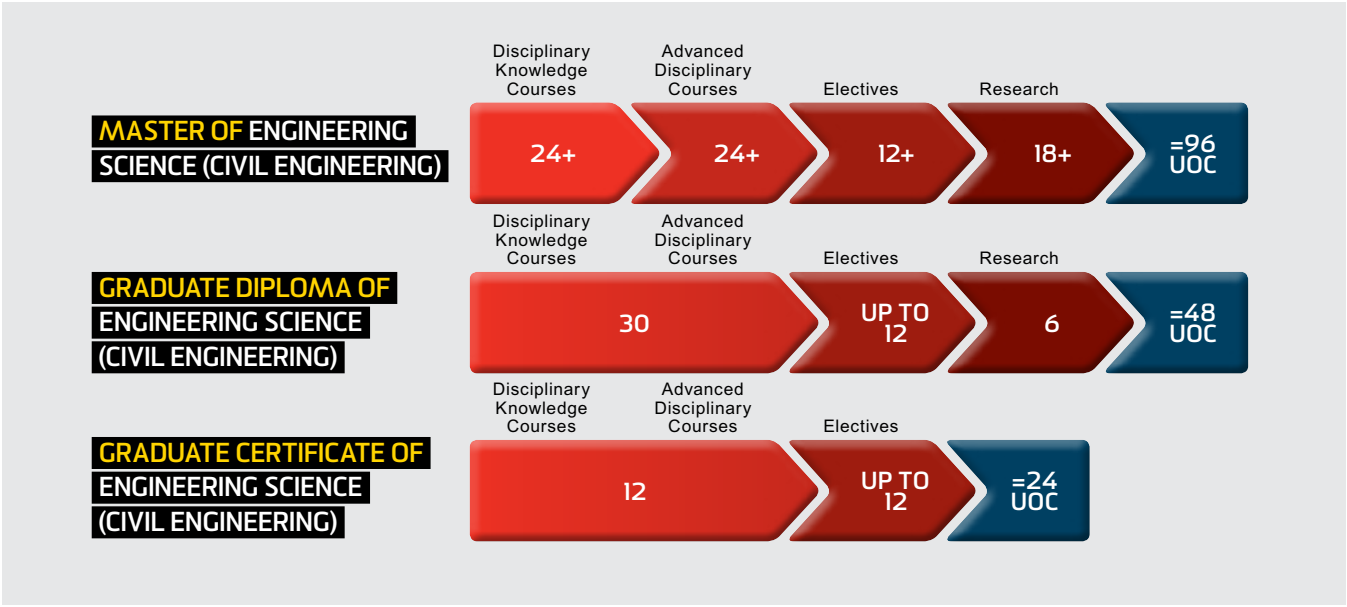
PROGRAM OPTIONS	PROGRAM CODE	UNITS OF CREDIT	DURATION*	COMMENCE
Master of Engineering Science (Civil Engineering)	CVENZS8338	96	2 years	Feb, Jul
Graduate Diploma of Engineering Science (Civil Engineering)	CVENAT5341	48	1 year	Feb, Jul
Graduate Certificate of Engineering Science (Civil Engineering)	CVENGT7320	24	6 months	Feb, Jul

* Eligible students may apply for credit for up to eight courses (48 UOC) of the Master of Engineering Science or four courses (24 UOC) of Graduate Diploma programs depending on previous study and professional experience. This can reduce the time taken by up to a year.

WHAT YOU WILL LEARN

This broad and flexible program is designed to provide civil engineers with advanced study options across the wide range of our civil engineering disciplines and allows the student to tailor their study in areas like project management, transport engineering, water and wastewater, surveying and construction management. Students will graduate with real skills in analysis, research and technical capability.

TYPICAL PROGRAM STRUCTURE



DISCIPLINARY KNOWLEDGE COURSES (PROFESSIONAL DEVELOPMENT)

Students who are moving from a different discipline, or have not completed appropriate undergraduate courses, will be advised to take suitable courses (Disciplinary Knowledge).

This will ensure they are prepared for the Advanced Disciplinary Knowledge Courses in subject areas including project management, geotechnical engineering, structures, surveying, transport or water and waste water.

Subjects may include:

- CVEN4101 Problem Solving for Engineers
- CVEN4102 Operations and Project
- CVEN4103 Engineering Contract
- CVEN4104 Sustainability in Construction
- CVEN4201 Rock and Slope Engineering
- CVEN4202 Advanced Topics in Geotechnical Engineering
- CVEN4204 Ground Improvement and Monitoring Techniques.
- CVEN4301 Advanced Concrete Structures
- CVEN4308 Structural Dynamics
- CVEN4310 Deformation Monitoring Surveys
- CVEN4402 Transport Systems - Part 1: Network Analysis
- CVEN4506 Advanced Water Engineering
- CVEN4701 Sustainable Infrastructure.

ADVANCED DISCIPLINARY KNOWLEDGE COURSES (SPECIALISATION COURSES)

These are the main courses that make up the chosen specialisation. Students may take courses from any postgraduate specialisation offered from the School of Civil and Environmental Engineering subject to satisfying any prerequisite requirements. See lists of courses in specific specialisations in the following pages.

ELECTIVES

At least one course (6 UOC) must be taken from the approved list of Engineering and Technical Management Courses. We recommend:

- CVEN9701 Engineering Economics and Financial Management
- CVEN9723 Design of Construction Operations
- CVEN9731 Project Management Framework
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning.

All other electives may be chosen across the Faculty, as long as the student is eligible to enrol.

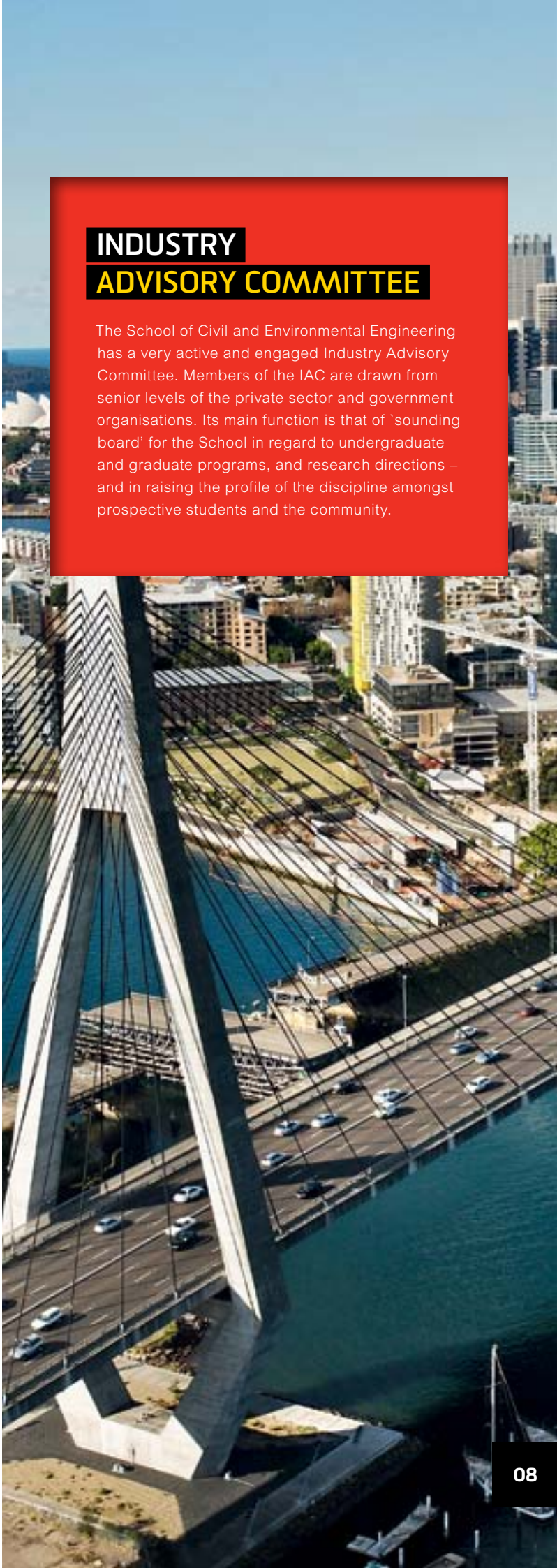
For a list of courses available each semester please see the School website: ***engineering.unsw.edu.au/civil-engineering/resources/timetables***

RESEARCH:

Students who have not completed a four year degree which included a thesis must complete a 12 UOC Masters Thesis research component that gives them the opportunity to broaden their understanding of a topic that they are passionate about. The research will be supervised by an appropriate academic. All students must undertake GSOE9010 Engineering Postgraduate Coursework Research Essentials (6 UOC).

INDUSTRY ADVISORY COMMITTEE

The School of Civil and Environmental Engineering has a very active and engaged Industry Advisory Committee. Members of the IAC are drawn from senior levels of the private sector and government organisations. Its main function is that of `sounding board' for the School in regard to undergraduate and graduate programs, and research directions – and in raising the profile of the discipline amongst prospective students and the community.



ENVIRONMENTAL ENGINEERING

Environmental Engineering is concerned with safe, ecological, sustainable and ethical development of urban infrastructure. If you would like to explore options to help move your engineering career in the direction of environmental engineering or if you would like to gain formal qualifications, a postgraduate coursework program from the Faculty of Engineering at UNSW is an ideal way to deepen your knowledge and hone your skills.

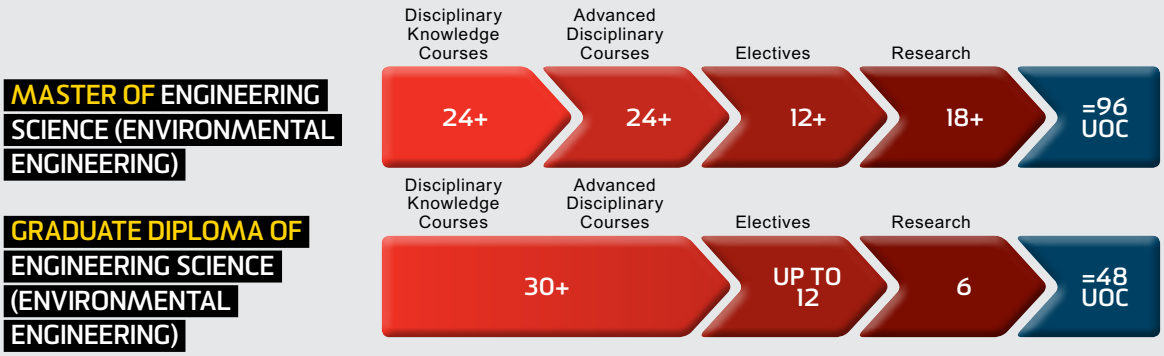
PROGRAM OPTIONS	PROGRAM CODE	UNITS OF CREDIT	DURATION*	COMMENCE
Master of Engineering Science (Environmental Engineering)	CVENMT8338	96	2 years	Feb, Jul
Graduate Diploma of Engineering Science (Environmental Engineering)	CVENDT5341	48	1 year	Feb, Jul

* Eligible students may apply for credit for up to eight courses (48 UOC) of the Master of Engineering Science or four courses (24 UOC) of Graduate Diploma programs depending on previous study and professional experience. This can reduce the time taken by up to a year.

WHAT YOU WILL LEARN

The Master of Engineering Science provides students with advanced study options in environmental engineering. Designed specifically to develop skills in analysis and design of sustainable urban infrastructure, this program is ideally suited for both practising engineers and recent graduates planning a career in environmental engineering.

TYPICAL PROGRAM STRUCTURE



DISCIPLINARY KNOWLEDGE COURSES (PROFESSIONAL DEVELOPMENT)

Students who are moving from a different discipline, or have not completed appropriate undergraduate courses, will be advised to take suitable courses (Disciplinary Knowledge) so they are prepared for the Advanced Disciplinary Knowledge Courses. Courses can be chosen from:

- CVEN4002 Design Practice A
- CVEN4102 Operations and Projects
- CVEN4103 Engineering Contracts
- CVEN4104 Sustainability in Construction
- CVEN4201 Rock and Slope Engineering
- CVEN4310 Deformation Monitoring Surveys
- CVEN4205 Contaminated Site Engineering.

ADVANCED DISCIPLINARY KNOWLEDGE COURSES (SPECIALISATION COURSES)

These are the main courses of your chosen specialisation. Choose from:

- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment
- CVEN9884 Environmental Engineering Science 1
- CVEN9885 Environmental Engineering Science 2.

ELECTIVES

At least one course (6 UOC) must be taken from the approved list of Engineering and Technical Management Courses. We recommend:

- CVEN9701 Engineering Economics and Financial Management
- CVEN9731 Project Management Framework.

All other electives may be chosen across the faculty, as long as the student is eligible to enrol. Some to consider include:

- CVEN9872 Solid Waste Management
- CVEN9881 Hazardous Waste Management
- CVEN9856 Water Treatment
- CVEN9857 Wastewater Treatment
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning
- CVEN9855 Water and Wastewater Analysis
- CVEN9405 Urban Transport Planning Practice
- CVEN9407 Transport Modelling
- CVEN9415 Transport Systems – Part 2: Queuing Theory
- CVEN9610 Surface Water Hydrology
- CVEN9611 Urban Hydrology
- CVEN9612 Catchment and Water Resources Modelling
- CVEN9620 Channels, Rivers and Estuaries
- CVEN9630 Groundwater Engineering
- CVEN9640 Waves and Beaches
- GSOE9110 Energy Efficiency in the Water Sector.

For a list of courses available each semester please see the School website: ***engineering.unsw.edu.au/civil-engineering/resources/timetables***

RESEARCH

Students who have not completed a four year degree which included a thesis must complete a 12 UOC Masters Thesis research component that gives them the opportunity to broaden their understanding of a topic that they are passionate about. The research will be supervised by an appropriate academic. All students must undertake GSOE9010 Engineering Postgraduate Coursework Research Essentials (6 UOC).

GEOSPATIAL ENGINEERING

The Geospatial Engineering program at UNSW Engineering provides advanced training to help you advance your career in your chosen field. Students will improve their analytical, problem-solving and communications skills, and develop capacities for teamwork and management plus undertake a compulsory research project that provides a greater practical experience in an area that they are passionate about.

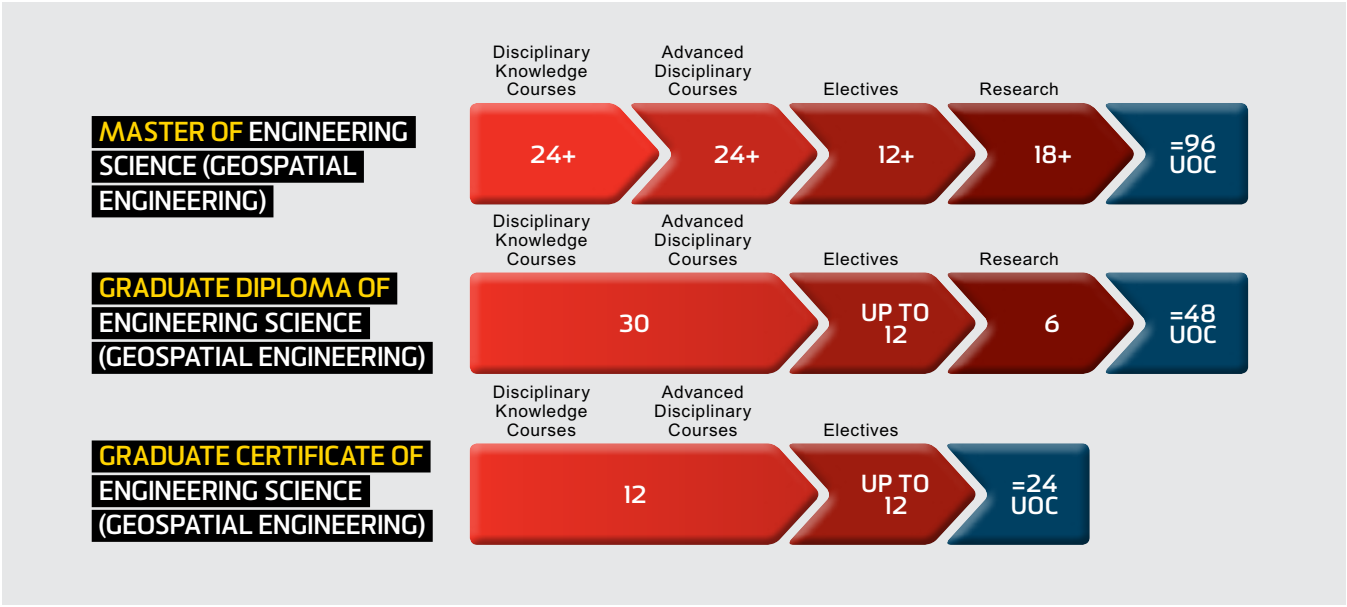
PROGRAM OPTIONS	PROGRAM CODE	UNITS OF CREDIT	DURATION*	COMMENCE
Master of Engineering Science (Geospatial Engineering)	CVENNT8338	96	2 years	Feb, Jul
Graduate Diploma of Engineering Science (Geospatial Engineering)	CVENPT5341	48	1 year	Feb, Jul
Graduate Certificate of Engineering Science (Geospatial Engineering)	CVENOT7320	24	6 months	Feb, Jul

* Eligible students may apply for credit for up to eight courses (48 UOC) of the Master of Engineering Science or four courses (24 UOC) of Graduate Diploma programs depending on previous study and professional experience. This can reduce the time taken by up to a year.

WHAT YOU WILL LEARN

This specialisation provides students with advanced study options across a range of topics in geospatial engineering, including advanced surveying, modern geodesy and geopositioning, GPS/GNSS technology, geospatial image analysis, Geographic Information Systems (GIS), and remote sensing. The program provides sufficient knowledge about the science and practice of geospatial engineering which should be required for students moving to industry or staying in the graduate program pursuing their PhD studies.

TYPICAL PROGRAM STRUCTURE



DISCIPLINARY KNOWLEDGE COURSES (PROFESSIONAL DEVELOPMENT)

Students who are moving from a different discipline, or have not completed appropriate undergraduate courses, will be advised to take suitable courses (Disciplinary Knowledge) so they are prepared for the Advanced Disciplinary Knowledge Courses.

Courses can be chosen from:

- CVEN4101 Problem Solving for Engineers
- CVEN4310 Deformation Monitoring Surveys
- GMAT4220 Geospatial Information Science*
- GMAT9212 Precise GPS Positioning
- GSOE9712 Engineering Statistics
- COMP9021 Principles of Programming.

ADVANCED DISCIPLINARY KNOWLEDGE COURSES (SPECIALISATION COURSES)

These are the main courses of your chosen specialisation. Choose from:

- GMAT9205 Fundamentals of Geopositioning*
- GMAT9211 Modern Geodesy and Applications
- GMAT9300 Aerial and Satellite Imaging Systems
- COMP9517 Computer Vision
- COMP9311 Database Systems
- GMAT9600 Remote Sensing*
- GMAT9606 Microwave Remote Sensing.

ELECTIVES

At least one course (6 UOC) must be taken from the approved list of Engineering and Technical Management Courses. We recommend:

- CVEN9701 Engineering Economics and Financial Management
- CVEN9731 Project Management Framework
- CVEN9888 Environmental Management.

All other electives may be chosen across the faculty, as long as the student is eligible to enrol. Some to consider include:

- CVEN9702 Project Planning and Control
- CVEN9710 Management of Risk
- CVEN9407 Transport Modelling
- CVEN9888 Environmental Management
- CVEN9512 Geomechanics
- CVEN9802 Structural Stability
- GMAT9211 Modern Geodesy and Applications
- GMAT9300 Aerial and Satellite Imaging Systems
- GMAT9606 Microwave Remote Sensing
- COMP9517 Computer Vision
- COMP9311 Database Systems
- COMP9024 Data Structures and Algorithms
- PLAN9018 Transport Applications of GIS
- BENV7728 GIS for Built Environment.

For a list of courses available each semester please see the School website: ***engineering.unsw.edu.au/civil-engineering/resources/timetables***

RESEARCH

Students who have not completed a four year degree which included a thesis must complete a 12 UOC Masters Thesis research component that gives them the opportunity to broaden their understanding of a topic that they are passionate about. The research will be supervised by an appropriate academic. All students must undertake GSOE9010 Engineering Postgraduate Coursework Research Essentials (6 UOC).

* compulsory courses

GEOSPATIAL ENGINEERING FACILITIES

There are a number of specific Surveying and Geospatial Engineering facilities within the Satellite Navigation and Positioning (SNAP) Lab including:

- State-of-the-art computing facilities essential to this IT-intensive discipline
- A wide variety of GPS/GNSS equipment for tracking GPS, Glonass, Galileo, QZSS and Beidou
- Leica C5 Laser scanner and software
- Sensefly Swinglet Unmanned Aerial Vehicle and software
- Spirent GSS6560 GPS RF signal simulator with INS upgrade
- Two GPS software receivers: the DataFusion Matlab receiver, and the NordNav R30
- Several Altera FPGA development systems
- Several GPS Software Development Kits, inertial navigation sensors, pseudolites, wireless comms and UHF radio equipment, and a range of ancillary equipment to support research into GPS and other wireless location technologies
- A range of GPS software systems (many developed in-house) as well as the GAMIT and Bernese software packages
- Software for SAR and InSAR data processing (some developed in-house) as well as the APP and EV InSAR (Atlantis, Canada), PulSAR (Phoenix Systems, UK), ROI-PAC (JPL, USA) and DORIS (Delft University of Technology, Netherlands)
- Software packages to aid teaching and research for field-to-finish surveying systems: Leica Geomatics Office, GEOCOMP, CIVILCAD and AUTOCAD
- Other software support such as MATLAB, RTK-Lib and others.

GEOTECHNICAL ENGINEERING AND ENGINEERING GEOLOGY

At UNSW Engineering we offer a comprehensive program in Geotechnical Engineering and Engineering Geology. If you are seeking ways to expand your career options in this industry or would like to move your existing engineering career in a new direction, the Master of Engineering Science is the perfect way to acquire the skills and knowledge you need.

PROGRAM OPTIONS	PROGRAM CODE	UNITS OF CREDIT	DURATION*	COMMENCE
Master of Engineering Science (Geotechnical Engineering and Engineering Geology)	CVENRT8338	96	2 years	Feb, Jul
Graduate Diploma of Engineering Science (Geotechnical Engineering and Engineering Geology)	CVENST5341	48	1 year	Feb, Jul

* Eligible students may apply for credit for up to eight courses (48 UOC) of the Master of Engineering Science or four courses (24 UOC) of Graduate Diploma programs depending on previous study and professional experience. This can reduce the time taken by up to a year.

WHAT YOU WILL LEARN

This specialisation provides students with advanced study options in geotechnical engineering and engineering geology. It has been developed for practitioners to enhance and deepen their practical and theoretical knowledge. Courses are taught by academic and industry experts usually with a one-week only attendance requirement at UNSW campus for each course.

TYPICAL PROGRAM STRUCTURE

DISCIPLINARY KNOWLEDGE COURSES (PROFESSIONAL DEVELOPMENT)

Students who are moving from a different discipline, or have not completed appropriate undergraduate courses, will be advised to take suitable courses (Disciplinary Knowledge) so they are prepared for the Advanced Disciplinary Knowledge Courses. Students without adequate background in geomechanics must choose CVEN9525 Fundamentals of Geomechanics. All other courses may be chosen from:

- CVEN4002 Design Practice A
- CVEN4102 Operations and Projects
- CVEN4201 Rock and Slope Engineering
- CVEN4202 Advanced Topics in Geotechnical Engineering
- CVEN4204 Ground Improvement and Monitoring Techniques
- CVEN4301 Advanced Concrete Structures
- CVEN4308 Structural Dynamics
- CVEN4310 Deformation Monitoring Surveys.

ADVANCED DISCIPLINARY KNOWLEDGE COURSES (SPECIALISATION COURSES)

These are the main courses of your chosen specialisation. Choose from:

- CVEN9511 Geotechnical Models
- CVEN9512 Geomechanics
- CVEN9513 Advanced Foundation Engineering
- CVEN9514 Numerical Methods Geotechnical Engineering
- CVEN9521 Slope Instability
- CVEN9522 Rock Engineering
- CVEN9523 Pavement Engineering
- CVEN9524 Geotechnical Engineering of Dams.

ELECTIVES

At least one course (6 UOC) must be taken from the approved list of Engineering and Technical Management Courses. We recommend:

- CVEN9701 Engineering Economics and Financial Management
- CVEN9731 Project Management Framework
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning.

All other electives may be chosen to complement the student's interests, as long as the student is eligible to enrol. The following details some possibilities:

Project and Construction Management

- CVEN9701 Engineering Economics and Financial Management
- CVEN9710 Management of Risk
- CVEN9723 Design of Construction Operations
- CVEN9731 Project Management Framework
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning.

Structural Engineering

- CVEN9802 Structural Stability
- CVEN9806 Prestressed Concrete Design
- CVEN9809 Reinforced Concrete Design
- CVEN9820 Computational Structural Mechanics
- CVEN9822 Steel and Composite Structures
- CVEN9824 Advanced Materials Technology.

Transport Engineering

- CVEN9405 Urban Transport Planning Practice
- CVEN9407 Transport Modelling
- CVEN9415 Transport Systems – Part 2: Queuing Theory
- CVEN9422 Traffic Management and Control.

Water Engineering

- CVEN9612 Catchment and Water Resources Modelling
- CVEN9611 Urban Hydrology
- CVEN9610 Surface Water Hydrology
- CVEN9620 Channels, Rivers and Estuaries
- CVEN9630 Groundwater Engineering
- CVEN9640 Waves and Beaches
- CVEN9855 Water and Wastewater Analysis.

For a list of courses available each semester please see the School website: ***engineering.unsw.edu.au/civil-engineering/resources/timetables***

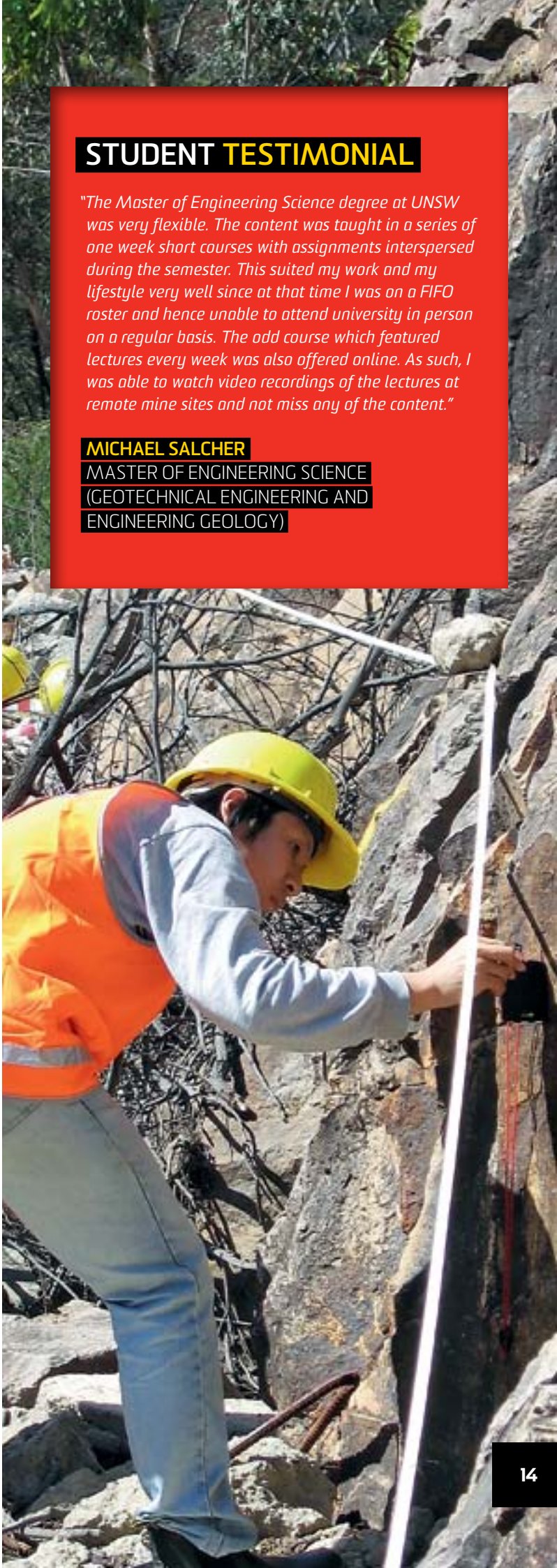
RESEARCH

Students who have not completed a four year degree which included a thesis must complete a 12 UOC Masters Thesis research component that gives them the opportunity to broaden their understanding of a topic that they are passionate about. The research will be supervised by an appropriate academic. All students must undertake GSOE9010 Engineering Postgraduate Coursework Research Essentials (6 UOC).

STUDENT TESTIMONIAL

"The Master of Engineering Science degree at UNSW was very flexible. The content was taught in a series of one week short courses with assignments interspersed during the semester. This suited my work and my lifestyle very well since at that time I was on a FIFO roster and hence unable to attend university in person on a regular basis. The odd course which featured lectures every week was also offered online. As such, I was able to watch video recordings of the lectures at remote mine sites and not miss any of the content."

MICHAEL SALCHER
MASTER OF ENGINEERING SCIENCE (GEOTECHNICAL ENGINEERING AND ENGINEERING GEOLOGY)



PROJECT MANAGEMENT

Postgraduate study in Project Management provides students with the skills to excel in a professional career in either public or private sectors, at various levels of responsibility – from strategic management through to detail. Designed as a professional qualification for practitioners, and the result of extensive consultation with industry, this program enables graduates to take a leading role in industry.

PROGRAM OPTIONS	PROGRAM CODE	UNITS OF CREDIT	DURATION*	COMMENCE
Master of Engineering Science (Project Management)	CVENFT8338	96	2 years	Feb, Jul
Graduate Diploma of Engineering Science (Project Management)	CVENET5341	48	1 year	Feb, Jul

* Eligible students may apply for credit for up to eight courses (48 UOC) of the Master of Engineering Science or four courses (24 UOC) of Graduate Diploma programs depending on previous study and professional experience. This can reduce the time taken by up to a year.

WHAT YOU WILL LEARN

Learn how to deliver your programs on time, on budget, and without nasty surprises. The program, developed with extensive industry consultation, covers the fundamentals and applications in project management including planning, risk, contracts, people, equipment, materials, legal, finances and economics.

TYPICAL PROGRAM STRUCTURE

DISCIPLINARY KNOWLEDGE COURSES (PROFESSIONAL DEVELOPMENT)

Students who are moving from a different discipline, or have not completed appropriate undergraduate courses, will be advised to take suitable courses (Disciplinary Knowledge) so they are prepared for the Advanced Disciplinary Knowledge Courses. Students can select courses from a list that includes:

- CVEN4101 Problem Solving for Engineers
- CVEN4102 Operations and Projects
- CVEN4103 Engineering Contracts
- CVEN4104 Sustainability in Construction
- CVEN4201 Rock and Slope Engineering
- CVEN4205 Contaminated Site Engineering
- CVEN4301 Advanced Concrete Structures
- CVEN4402 Transport Systems – Network Analysis
- CVEN4503 Groundwater Investigations.

ADVANCED DISCIPLINARY KNOWLEDGE COURSES (SPECIALISATION COURSES)

These are the main courses of your chosen specialisation. Choose from a list that includes:

- CVEN9702 Project Planning and Control
- CVEN9706 Human Resources Management
- CVEN9707 Contracts Management
- CVEN9710 Management of Risk
- CVEN9712 Dispute Avoidance
- CVEN9714 Resource Management
- CVEN9717 Marketing in Technology and Engineering
- CVEN9718 Strategic Management for Engineering
- CVEN9723 Design of Construction Operations
- CVEN9726 Legal Studies and Professional Practice
- CVEN9730 International Project Management.

ELECTIVES

At least one course (6 UOC) must be taken from the Engineering and Technical Management Courses. We recommend:

- CVEN9701 Engineering Economics and Financial Management
- CVEN9731 Project Management Framework
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning.

All other electives may be chosen to complement the student's interests, as long as the student is eligible to enrol. The following details some possibilities:

- CVEN9405 Urban Transport Planning Practice
- CVEN9407 Transport Modelling
- CVEN9414 Transport Systems Part 1
- CVEN9422 Traffic Management and Control
- CVEN9511 Geotech Models and Site Investigations
- CVEN9512 Geomechanics
- CVEN9513 Advanced Foundation Engineering
- CVEN9521 Slope Instability and Stabilisation
- CVEN9522 Rock Engineering
- CVEN9524 Geotechnical Engineering of Dams
- CVEN9525 Fundamentals of Geomechanics
- CVEN9610 Surface Water Hydrology
- CVEN9611 Urban Hydrology
- CVEN9612 Catchment and WR Modelling
- CVEN9620 Channels, Rivers and Estuaries
- CVEN9630 Groundwater Hydrology
- CVEN9802 Structural Stability
- CVEN9806 Prestressed Concrete Design
- CVEN9809 Reinforced Concrete Design
- CVEN9820 Computational Structural Mechanics
- CVEN9822 Steel Structures
- CVEN9824 Advanced Materials Technology
- CVEN9855 Water and Wastewater Analysis
- CVEN9856 Water Treatment
- CVEN9857 Wastewater Treatment
- CVEN9872 Solid Waste Management
- CVEN9884 Environmental Engineering Science 1
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment
- GEOS9016 Principles of Geographic Information Systems and Science
- GMAT9205 Fundamentals of Geopositioning.

For a list of courses available each semester please see the School website: ***engineering.unsw.edu.au/civil-engineering/resources/timetables***

RESEARCH

Students who have not completed a four year degree which included a thesis must complete a 12 UOC Masters Thesis research component that gives them the opportunity to broaden their understanding of a topic that they are passionate about. The research will be supervised by an appropriate academic. All students must undertake GSOE9010 Engineering Postgraduate Coursework Research Essentials (6 UOC).

STUDENT TESTIMONIAL

"The strengths of the Master of Engineering Science program were that it focused on a wide range of topics relevant to the project management discipline, as well as closely tying them to practices that occur in my workplace. I found the course material very relevant to my day-to-day work life. I know it seems obvious, but if you genuinely enjoy the coursework it makes it much more compelling to sit down and study."

CLAUDELLE TAYLOR
MASTER OF ENGINEERING SCIENCE
(PROJECT MANAGEMENT)

STRUCTURAL ENGINEERING

This program is ideally suited for both practising structural engineers and recent graduates planning a career in structural engineering. It is designed to develop skills in analysis and design of steel and concrete structures, with an understanding of modern materials.

PROGRAM OPTIONS	PROGRAM CODE	UNITS OF CREDIT	DURATION*	COMMENCE
Masters of Engineering Science (Structural Engineering)	CVENXS8338	96	2 years	Feb, Jul
Graduate Diploma of Engineering Science (Structural Engineering)	CVENWS5341	48	1 year	Feb, Jul

* Eligible students may apply for credit for up to eight courses (48 UOC) of the Master of Engineering Science or four courses (24 UOC) of Graduate Diploma programs depending on previous study and professional experience. This can reduce the time taken by up to a year.

WHAT YOU WILL LEARN

This program allows students to develop advanced and professional skills in computational analysis and design of steel, reinforced, composite and prestressed concrete structures.

TYPICAL PROGRAM STRUCTURE

DISCIPLINARY KNOWLEDGE COURSES (PROFESSIONAL DEVELOPMENT)

Students who are moving from a different discipline, or have not completed appropriate undergraduate courses, will be advised to take suitable courses (Disciplinary Knowledge) so they are prepared for the Advanced Disciplinary Knowledge Courses. Students can select courses from:

- CVEN4101 Problem Solving for Engineers
- CVEN4102 Operations and Projects
- CVEN4103 Engineering Contracts
- CVEN4104 Sustainability in Construction
- CVEN4201 Rock and Slope Engineering
- CVEN4202 Advanced Topics in Geotechnical Engineering
- CVEN4203 Geomechanics
- CVEN4205 Contaminated Site Engineering
- CVEN4301 Advanced Concrete Structures.
- CVEN4308 Structural Dynamics
- CVEN4310 Deformation Monitoring Surveys
- CVEN4402 Transport Systems – Network Analysis
- CVEN4404 Fundamentals of Traffic Engineering
- CVEN4503 Groundwater Investigations
- CVEN4506 Advanced Water Engineering.

ADVANCED DISCIPLINARY KNOWLEDGE COURSES (SPECIALISATION COURSES)

These are the main courses of your chosen specialisation. Choose from:

- CVEN9802 Structural Stability
- CVEN9806 Prestressed Concrete Design
- CVEN9820 Computational Structural Mechanics
- CVEN9809 Reinforced Concrete Design
- CVEN9822 Steel and Composite Structures
- CVEN9824 Advanced Materials Technology.

ELECTIVES

At least one course (6 UOC) must be taken from the Engineering and Technical Management Courses. We recommend:

- CVEN9701 Engineering Economics and Financial Management
- CVEN9731 Project Management Framework
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning.

All other electives may be chosen to complement the student's interests, as long as the student is eligible to enrol. The following details some possibilities:

Project and Construction Management

- CVEN9701 Engineering Economics and Financial Management
- CVEN9710 Management of Risk
- CVEN9723 Design of Construction Operations
- CVEN9731 Project Management Framework
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning.

Geotechnical Engineering

- CVEN9511 Geotechnical Models and Site Investigation
- CVEN9512 Geomechanics
- CVEN9513 Advanced Foundation Engineering
- CVEN9514 Numerical Methods in Geotechnical Engineering
- CVEN9521 Slope Instability
- CVEN9522 Rock Engineering
- CVEN9523 Pavement Engineering
- CVEN9524 Geotechnical Engineering of Dams
- CVEN9525 Fundamentals of Geomechanics.

Transport Engineering

- CVEN9405 Urban Transport Planning Practice
- CVEN9407 Transport Modelling
- CVEN9415 Transport Systems – Part 2: Queuing Theory
- CVEN9422 Traffic Management and Control.

Water Engineering

- CVEN9610 Surface Water Hydrology
- CVEN9611 Urban Hydrology
- CVEN9612 Catchment and Water Resources Modelling
- CVEN9620 Channels, Rivers and Estuaries
- CVEN9630 Groundwater Engineering
- CVEN9640 Waves and Beaches
- CVEN9855 Water and Wastewater Analysis.

For a list of courses available each semester please see the School website: ***engineering.unsw.edu.au/civil-engineering/resources/timetables***

RESEARCH

Students who have not completed a four year degree which included a thesis must complete a 12 UOC Masters Thesis research component that gives them the opportunity to broaden their understanding of a topic that they are passionate about. The research will be supervised by an appropriate academic. All students must undertake GSOE9010 Engineering Postgraduate Coursework Research Essentials (6 UOC).

STUDENT TESTIMONIAL

"I chose UNSW because it is one of Australia's leading teaching universities with world-recognised research and strong industry links. The Structural Engineering program teaches thorough technical knowledge which can be applied to projects in any company or environment, and all assignments are focused on helping you to understand the problem and apply engineering knowledge to reach the right solution."

MOHAMMAD HAGHIGHAT
MASTER OF STRUCTURAL ENGINEERING

TRANSPORT ENGINEERING

With increases in population and urban sprawl, the need for a safe, quick, reliable and efficient transport system has never been more important. Transport engineering looks at the planning, functional design, operation and management of transport infrastructure – with some focus on the economical and environmental impact of decisions. If you are interested in moving your career into transport engineering, or you simply want to broaden your skills and knowledge in the field, we offer a fantastic Masters program that will give you the step up you need to get ahead

PROGRAM OPTIONS	PROGRAM CODE	UNITS OF CREDIT	DURATION*	COMMENCE
Master of Engineering Science (Transport Engineering)	CVENCT8338	96	2 years	Feb, Jul
Graduate Diploma of Engineering Science (Transport Engineering)	CVENBT5341	48	1 year	Feb, Jul

* Eligible students may apply for credit for up to eight courses (48 UOC) of the Master of Engineering Science or four courses (24 UOC) of Graduate Diploma programs depending on previous study and professional experience. This can reduce the time taken by up to a year.

WHAT YOU WILL LEARN

This program provides students with advanced study options in transport engineering – from transport planning, ITS, and land use to risk management and safety to network design, demand estimation and sustainability, emission and health.

Designed to develop skills in modelling and analysing transport systems (including passenger and freight) for various modes of transport, the program provides students with enough knowledge about the science and practice of transport engineering so they can step confidently into a role in transport engineering.

TYPICAL PROGRAM STRUCTURE

DISCIPLINARY KNOWLEDGE COURSES (PROFESSIONAL DEVELOPMENT)

Students who are moving from a different discipline, or have not completed appropriate undergraduate courses, will be advised to take suitable courses (Disciplinary Knowledge) so they are prepared for the Advanced Disciplinary Knowledge Courses. Students can select from:

- CVEN4103 Engineering Contracts
- CVEN4310 Deformation Monitoring Surveys
- CVEN4104 Project and System Skills
- CVEN4201 Rock and Slope Engineering
- CVEN4402 Transport Systems – Part 1: Network Analysis.

ADVANCED DISCIPLINARY KNOWLEDGE COURSES (SPECIALISATION COURSES)

These are the main courses of your chosen specialisation. Choose from:

- CVEN9405 Urban Transport Planning
- CVEN9407 Transport Modelling
- CVEN9415 Transport Systems – Part 2: Queuing Theory
- CVEN9422 Traffic Management and Control.

ELECTIVES

At least one course (6 UOC) must be taken from the Engineering and Technical Management Courses. We recommend:

- CVEN9701 Engineering Economics and Financial Management
- CVEN9731 Project Management Framework
- CVEN9888 Environmental Management.

All other electives may be chosen to complement the student's interests, as long as the student is eligible to enrol. The following details some possibilities:

- CVEN9702 Project Planning and Control
- CVEN9710 Management of Risk
- CVEN9723 Design of Construction Operations
- CVEN9855 Water and Wastewater Analysis
- CVEN9884 Environmental Engineering Science 1
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment
- CVEN9901 Special Topics
- CVEN9902 Special Topics
- GEOS9016 Principles of Geographic Information Systems and Science
- GMAT9205 Fundamentals of Geopositioning
- CVEN9701 Engineering Economics and Financial Management
- CVEN9731 Project Management Framework
- CVEN9885 Environmental Engineering Science 2
- BENV7724 Transport, Land Use and the Environment
- COMP9021 Principles of Programming
- COMP9024 Data Structures and Algorithms
- ECON6003 Econometric Analysis
- ECON6205 Choice Modelling
- GMAT9200 GPS Positioning
- GMAT9212 Precise GPS Positioning
- MATH5165 Optimisation
- MATH5855 Multivariate Analysis
- PLAN9018 Transport Applications of GIS
- AVIA5004 Aviation Safety and Accident Prevention
- AVIA5008 Air Traffic Management
- AVIA9201 Safety Risk Management
- AVIA5030 Aviation and Tourism.

For a list of courses available each semester please see the School website: ***engineering.unsw.edu.au/civil-engineering/resources/timetables***

RESEARCH

Students who have not completed a four year degree which included a thesis must complete a 12 UOC Masters Thesis research component that gives them the opportunity to broaden their understanding of a topic that they are passionate about. The research will be supervised by an appropriate academic. All students must undertake GSOE9010 Engineering Postgraduate Coursework Research Essentials (6 UOC).

ACADEMIC IN FOCUS

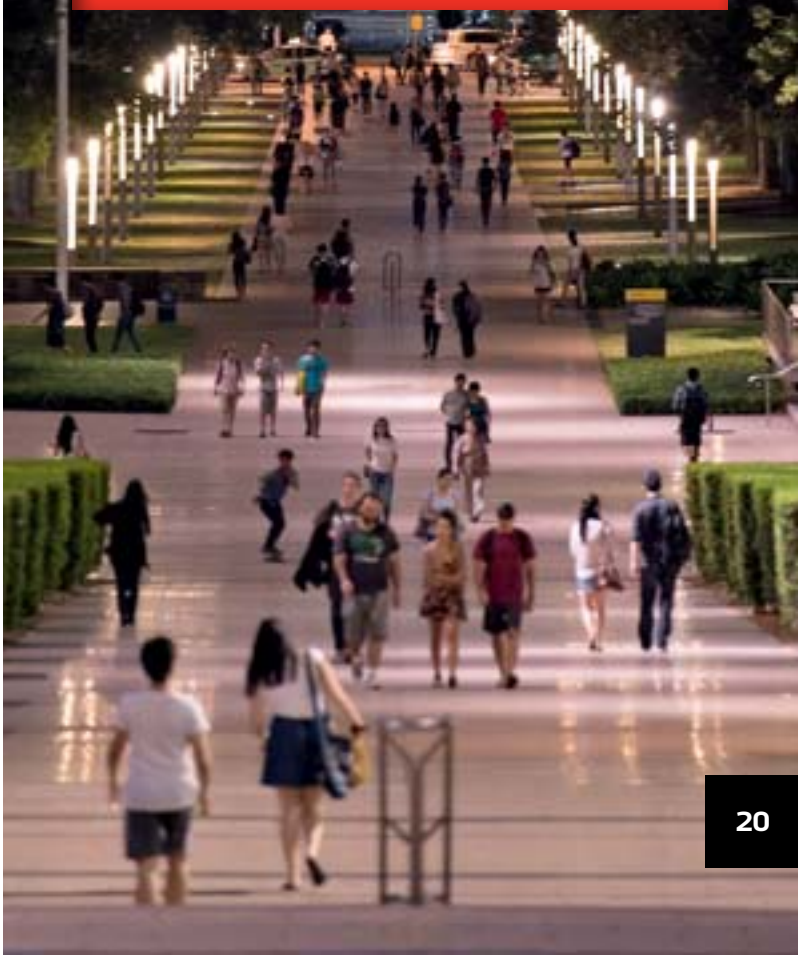
S Travis Waller is Director of the faculty-wide Research Centre for Integrated Transport Innovation (rCITI) based in the School of Civil and Environmental Engineering. His chair was established by International infrastructure-based advisory company, **Evans & Peck**, in 2010.

Professor Waller supervises a number of student research projects including:

- Real-time travel time prediction for motorways and motor way corridors
- Accounting for reliability in ridership modelling
- Regional dynamic transport network planning
- Environmental impact of real-time traffic management.

"I would advise prospective transport engineers to focus not just on their analytical skills, but also on how those skills tie into real world applications. For transport, we deal with humans, not electrons or information packets, and humans have psychology and individual behaviour. So you really have to get a wide range of skills, from engineering principles, to physics, economics, and human psychology. Transport engineering is about synthesising and bringing together all of these interdisciplinary concepts into one field."

PROFESSOR S TRAVIS WALLER
SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING



WATER ENGINEERING: CATCHMENTS TO COAST

For engineers and other professionals interested in expanding their knowledge and skills in water engineering, we offer advanced training in Water Engineering: catchments to coast – which looks at the full cycle of water in natural and engineered systems. Courses are offered by staff who are national leaders in their areas of expertise, and who often undertake higher level research and consultancy services for industry and government. It is ideally suited for practicing water engineers and recent graduates planning a career in large-scale water engineering.

PROGRAM OPTIONS	PROGRAM CODE	UNITS OF CREDIT	DURATION*	COMMENCE
Master of Engineering Science (Water Engineering: catchments to coast)	CVENIT8338	96	2 years	Feb, Jul
Graduate Diploma of Engineering Science (Water Engineering: catchments to coast)	CVENHT5341	48	1 year	Feb, Jul

* Eligible students may apply for credit for up to eight courses (48 UOC) of the Master of Engineering Science or four courses (24 UOC) of Graduate Diploma programs depending on previous study and professional experience. This can reduce the time taken by up to a year.

WHAT YOU WILL LEARN

Taught by industry leaders, this program provides advanced study options in large-scale water engineering such as surface water hydrology, urban hydrology and stormwater management, catchment and water resources modelling, groundwater investigations, hydrodynamics of rivers and estuaries, and coastal engineering related to waves, beaches and coastal infrastructure.

TYPICAL PROGRAM STRUCTURE

DISCIPLINARY KNOWLEDGE COURSES (PROFESSIONAL DEVELOPMENT)

Students who are moving from a different discipline, or have not completed appropriate undergraduate courses, will be advised to take suitable courses (Disciplinary Knowledge) so they are prepared for the Advanced Disciplinary Knowledge Courses. Students can select from:

- CVEN4002 Design Practice A
- CVEN4102 Operations and Projects
- CVEN4103 Engineering Contracts
- CVEN4104 Sustainability in Construction
- CVEN4201 Rock and Slope Engineering
- CVEN4202 Advanced Topics in Geotechnical Engineering
- CVEN4204 Ground Improvement and Monitoring Techniques
- CVEN4301 Advanced Concrete Structures.
- CVEN4308 Structural Dynamics
- CVEN4310 Deformation Monitoring Surveys
- CVEN4503 Groundwater Investigations
- CVEN4507 Advanced Water Engineering
- CVEN9625 Fundamentals of Water Engineering.

ADVANCED DISCIPLINARY KNOWLEDGE COURSES (SPECIALISATION COURSES)

These are the main courses of your chosen specialisation. Choose from:

- CVEN9611 Urban Hydrology
- CVEN9612 Catchment and Water Resources Modelling
- CVEN9620 Channels, Rivers and Estuaries
- CVEN9630 Groundwater Engineering
- CVEN9640 Waves and Beaches.

ELECTIVES

At least one course (6 UOC) must be taken from the Engineering and Technical Management Courses. We recommend:

- CVEN9701 Engineering Economics and Financial Management
- CVEN9731 Project Management Framework
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning.

All other electives may be chosen to complement the student's interests, as long as the student is eligible to enrol. The following details some possibilities:

Project and Construction Management

- CVEN9701 Engineering Economics and Financial Management
- CVEN9710 Management of Risk
- CVEN9723 Design of Construction Operations
- CVEN9731 Project Management Framework
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning.

Geotechnical Engineering

- CVEN9511 Geotechnical Models and Site Investigation
- CVEN9512 Geomechanics
- CVEN9513 Advanced Foundation Engineering
- CVEN9514 Numerical Methods in Geotechnical Engineering
- CVEN9521 Slope Instability
- CVEN9522 Rock Engineering
- CVEN9523 Pavement Engineering
- CVEN9524 Geotechnical Engineering of Dams
- CVEN9525 Fundamentals of Geomechanics.

Structural Engineering

- CVEN9802 Structural Stability
- CVEN9806 Prestressed Concrete Design
- CVEN9809 Reinforced Concrete Design
- CVEN9820 Computational Structural Mechanics
- CVEN9822 Steel and Composite Structures
- CVEN9824 Advanced Materials Technology.

Transport Engineering

- CVEN9405 Urban Transport Planning Practice
- CVEN9407 Transport Modelling
- CVEN9415 Transport Systems – Part 2: Queuing Theory
- CVEN9422 Traffic Management and Control.

Water Engineering

- CVEN9855 Water and Wastewater Analysis.

For a list of courses available each semester please see the School website: ***engineering.unsw.edu.au/civil-engineering/resources/timetables***

RESEARCH

Students who have not completed a four year degree which included a thesis must complete a 12 UOC Masters Thesis research component that gives them the opportunity to broaden their understanding of a topic that they are passionate about. The research will be supervised by an appropriate academic. All students must undertake GSOE9010 Engineering Postgraduate Coursework Research Essentials (6 UOC).

WATER RESEARCH LABORATORY

The School of Civil and Environmental Engineering's Water Research Laboratory is a leading international consulting and research laboratory with over fifty years' experience. With a commercial projects team working alongside academics, and unique large-scale physical facilities, WRL provides expert advice and strategic solutions to industry and government relating to hydraulics, groundwater, and coastal and estuarine engineering.

For more information visit ***wrl.unsw.edu.au***

WATER, WASTEWATER AND WASTE ENGINEERING

Water is vital for almost every process on earth, yet the sourcing and use of water is subject to much scrutiny and debate. Effective and sustainable water and wastewater treatment and environmentally responsible waste management are now absolutely crucial for urban populations, given the environmental challenges facing Australia and the rest of the world. For engineers and other professionals interested in expanding their knowledge and skills in water, wastewater and waste engineering, we offer advanced study options in current and future technologies for water usage, wastewater treatment and waste disposal.

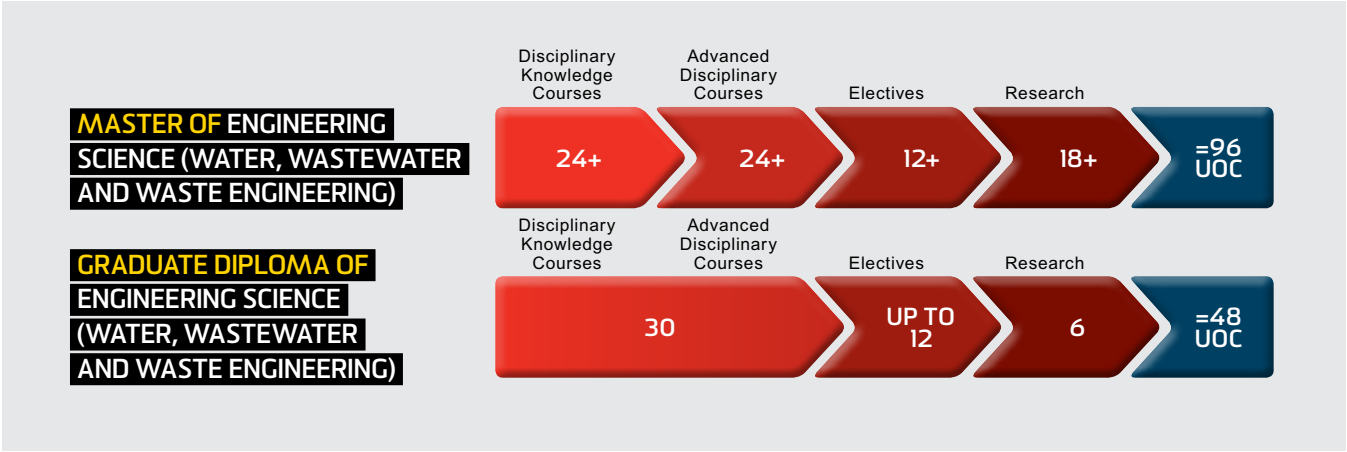
PROGRAM OPTIONS	PROGRAM CODE	UNITS OF CREDIT	DURATION*	COMMENCE
Master of Engineering Science (Water, Wastewater and Waste Engineering)	CVENKT8338	96	2 years	Feb, Jul
Graduate Diploma of Engineering Science (Water, Wastewater and Waste Engineering)	CVENJT5341	48	1 year	Feb, Jul

* Eligible students may apply for credit for up to eight courses (48 UOC) of the Master of Engineering Science or four courses (24 UOC) of Graduate Diploma programs depending on previous study and professional experience. This can reduce the time taken by up to a year.

WHAT YOU WILL LEARN

This specialisation provides technical professionals the opportunity to learn the fundamentals of current practice in this field and to engage with existing and future technologies. It is designed to develop skills in analysis and design of water, wastewater and waste treatment facilities and is ideally suited for both practising engineers and recent graduates planning a career in water, wastewater and waste engineering.

TYPICAL PROGRAM STRUCTURE



DISCIPLINARY KNOWLEDGE COURSES (PROFESSIONAL DEVELOPMENT)

Students who are moving from a different discipline, or have not completed appropriate undergraduate courses, will be advised to take suitable courses (Disciplinary Knowledge) so they are prepared for the Advanced Disciplinary Knowledge Courses. Students can select from:

- CVEN4002 Design Practice A
- CVEN4503 Groundwater Investigations
- CVEN4701 Sustainable Infrastructure
- CVEN4703 Advanced Water Quality Principles
- CVEN4310 Deformation Monitoring Surveys
- CVEN4205 Contaminated Site Engineering.

ADVANCED DISCIPLINARY KNOWLEDGE COURSES (SPECIALISATION COURSES)

These are the main courses of your chosen specialisation. Choose from:

- CVEN9872 Solid Waste Management
- CVEN9881 Hazardous Waste Management
- CVEN9856 Water Treatment
- CVEN9857 Wastewater Treatment
- CVEN9855 Water and Wastewater Analysis.

ELECTIVES

At least one course (6 UOC) must be taken from the Engineering and Technical Management Courses. We recommend:

- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning.

All other electives may be chosen to complement the student's interests, as long as the student is eligible to enrol. The following details some possibilities:

- CVEN9884 Environmental Engineering Science 1
- CVEN9885 Environmental Engineering Science 2
- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning
- CVEN9610 Surface Water Hydrology
- CVEN9611 Urban Hydrology
- CVEN9612 Catchment and Water Resources Modelling
- CVEN9620 Channels, Rivers and Estuaries
- CVEN9630 Groundwater Engineering
- CVEN9640 Waves and Beaches.

For a list of courses available each semester please see the School website: ***engineering.unsw.edu.au/civil-engineering/resources/timetables***

RESEARCH

Students who have not completed a four year degree which included a thesis must complete a 12 UOC Masters Thesis research component that gives them the opportunity to broaden their understanding of a topic that they are passionate about. The research will be supervised by an appropriate academic. All students must undertake GSOE9010 Engineering Postgraduate Coursework Research Essentials (6 UOC).

STUDENT TESTIMONIAL

"I was working as a water supply engineer in Malawi, my home country, and I chose to do the Master of Engineering Science in Water, Wastewater and Waste at UNSW because it is in line with my career. Here I am learning about advanced water and wastewater technologies and the latest research in water, wastewater and environmental management, as well as the key principles of sustainable development."

LETTOW CHILONGO
MASTER OF ENGINEERING SCIENCE (WATER, WASTEWATER AND WASTE ENGINEERING)

STUDENT TESTIMONIAL

"One of the things that stands out for me about the Masters program was the opportunity to visit Sydney Water. This field trip gave me a close understanding of the Sydney wastewater and drinking water treatment process. We had the chance to look at the treatment equipment and machinery, and were introduced to some state-of-the-art technology. These are things I would never have learned in a textbook."

KUN WU
MASTER OF ENVIRONMENTAL ENGINEERING

INDUSTRIAL TRAINING

All Master of Engineering students are required to complete a minimum of 60 days of Industrial Training as a component of their program. The aims of industrial training are to help students develop an appreciation of the structure and operation of industrial organisations, understand the role of the engineer and engineering in industry, develop their communication and interpersonal skills, and appreciate the ethical basis of engineering practice in industry.

The 60 days can be accumulated through more than one employer. Students must arrange their own industrial training.

MASTER OF ENGINEERING

STEP UP YOUR ENGINEERING KNOWLEDGE

The two year **Master of Engineering program** is especially designed as a pathway into professional engineering for students with degrees from non-accredited institutions or those with degrees at least equivalent to the first three years of a relevant accredited degree in Engineering (see more below in Entry Requirements).

This program is available in two specialisations – Civil Engineering and Environmental Engineering. It is all about flexibility and choice, with a wide selection of elective courses to tailor your degree to exactly your taste.

WHAT MAKES UP THE PROGRAM

16 COURSES (96 UOC) + 60 DAYS INDUSTRIAL EXPERIENCE

BENEFITS OF STUDY

Not only does the Master of Engineering provide a flexible pathway for gaining a quality postgraduate qualification, graduates at UNSW also receive so many other benefits from their study:

- An in-depth knowledge within their chosen discipline
- Deeper project experience
- Increased technical confidence in research
- Advanced knowledge and skills in engineering management
- Maintain continuing professional development standards
- Updated qualifications and knowledge to meet professional accreditation standards.

ENGINEERS AUSTRALIA ACCREDITED

The Master of Engineering specialisations are awaiting provisional professional accreditation from Engineers Australia.

CIVIL ENGINEERING

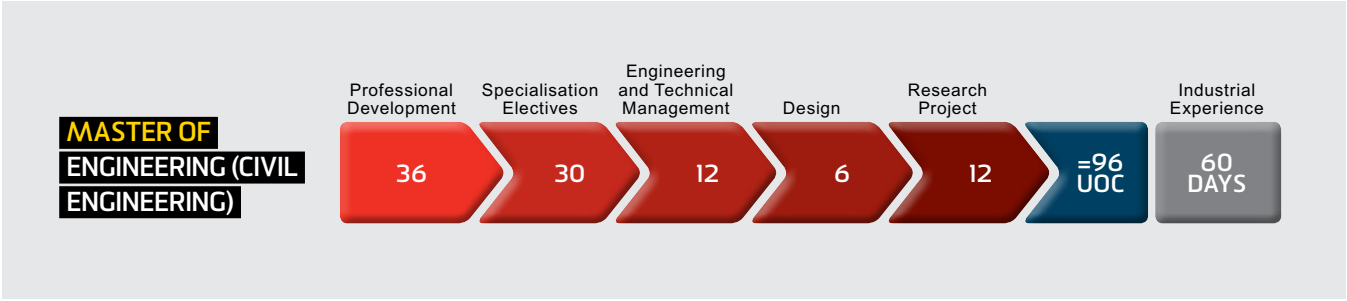
This two year Master of Engineering degree is especially designed for students who wish to increase their knowledge and skills in civil engineering but who may not qualify for entry to the Master of Engineering Science.

Flexibility and choice are maintained throughout the program as many elective courses are offered. Students can specialise and gain depth of knowledge across a broad range of areas, including project management, transport engineering, geotechnical engineering, water resources, waste and wastewater treatment. The program has provisional professional accreditation through Engineers Australia and is the perfect entry point for those who wish to move into the civil engineering profession.

WHAT YOU WILL LEARN

The Master of Engineering degree requires students to complete at least 96 UOC including professional development courses in engineering management, analysis and design and engineering and the environment plus more in-depth civil engineering specialisation and engineering management courses. A compulsory design course and research project plus 60 days of industrial experience mean students will have a firm grasp of all aspects of civil engineering upon graduation.

TYPICAL PROGRAM STRUCTURE



YEAR 1 – PROFESSIONAL DEVELOPMENT

8 courses (48 UOC)*

MANAGEMENT

Select a **minimum** of two courses (12 UOC) of management courses from the following list:

- CVEN4101 Problem Solving for Engineers
- CVEN4102 Operations and Projects
- CVEN4103 Engineering Contracts.

ANALYSIS AND DESIGN

Select a **minimum** of two courses (12 UOC) of analysis and design courses from the following list:

- CVEN4202 Advanced Topics in Geotechnical Engineering
- CVEN4301 Advanced Concrete Structures
- CVEN4507 Advanced Water Engineering
- CVEN4402 Transport Systems – Part 1: Network Analysis.

ENGINEERING AND THE ENVIRONMENT

Select a **minimum** of one course (6 UOC) of engineering and the environment courses from the following list:

- CVEN4701 Planning Sustainable Infrastructure
- CVEN4104 Sustainability in Construction.

ELECTIVES

Select a **maximum** of two courses (12 UOC) of elective courses from the following list:

- CVEN4310 Deformation Monitoring Surveys
- CVEN4201 Rock and Slope Engineering
- CVEN4204 Ground Improvement and Monitoring Techniques
- CVEN4308 Structural Dynamics.

* Students can select a range of courses, subject to satisfying the prerequisite requirements.

YEAR 2 – ADVANCED COURSES

8 courses (48 UOC)* including a compulsory design course and research project.

- CVEN9000 Design Practice
- CVEN9931 Masters Project A
- CVEN9932 Masters Project B.

Plus five courses (30 UOC) of elective courses taken from the following list (with **no more than** three courses (18 UOC) taken from any one discipline group):

Project and Construction Management:

- CVEN9701 Engineering Economics and Financial Management
- CVEN9702 Project Planning and Control
- CVEN9706 Human Resources Management
- CVEN9707 Contracts Management
- CVEN9710 Management of Risk
- CVEN9712 Dispute Avoidance
- CVEN9714 Resource Management
- CVEN9717 Marketing in Technology and Engineering
- CVEN9718 Strategic Management for Engineering
- CVEN9720 Problem Solving and Decision Making
- CVEN9723 Design of Construction Operations
- CVEN9726 Legal Studies and Professional Practice
- CVEN9730 International Project Management
- CVEN9731 Project Management Framework.

Geotechnical Engineering:

- CVEN9511 Geotechnical Models and Site Investigation
- CVEN9512 Geomechanics
- CVEN9513 Advanced Foundation Engineering
- CVEN9514 Numerical Methods in Geotechnical Engineering
- CVEN9521 Slope Instability
- CVEN9522 Rock Engineering
- CVEN9523 Pavement Engineering
- CVEN9524 Geotechnical Engineering of Dams.

Structural Engineering:

- CVEN9802 Structural Stability
- CVEN9806 Prestressed Concrete Design
- CVEN9809 Reinforced Concrete Design
- CVEN9820 Computational Structural Mechanics
- CVEN9822 Steel and Composite Structures
- CVEN9824 Advanced Materials Technology.

Transport Engineering:

- CVEN9405 Urban Transport Planning Practice
- CVEN9407 Transport Modelling
- CVEN9415 Transport Systems – Part 2: Queuing Theory
- CVEN9422 Traffic Management and Control.

Water Engineering:

- CVEN9610 Surface Water Hydrology
- CVEN9611 Urban Hydrology
- CVEN9612 Catchment and Water Resources Modelling
- CVEN9620 Channels, Rivers and Estuaries
- CVEN9630 Groundwater Engineering
- CVEN9640 Waves and Beaches
- CVEN9855 Water and Wastewater Analysis.

YEAR 2 – 60 DAYS OF INDUSTRIAL TRAINING

Students must complete ***60 days of Civil Engineering related industrial experience***.

ENTRY REQUIREMENTS

Entry is open to students with a four year non-accredited (under the Washington Accord) Bachelor of Engineering degree or equivalent. Alternatively, eligible applicants include those who hold a three year Engineering Science degree, at least equivalent to the first three years of a relevant Engineering degree accredited under the Washington Accord.

PROFESSIONAL RECOGNITION

The Master of Engineering in Civil Engineering is currently awaiting provisional professional accreditation by Engineers Australia.

DELIVERY MODE

Face-to-face teaching is our strength, all part of our campus experience. Certain courses are offered in intensive short course mode or by distance.

ENVIRONMENTAL ENGINEERING

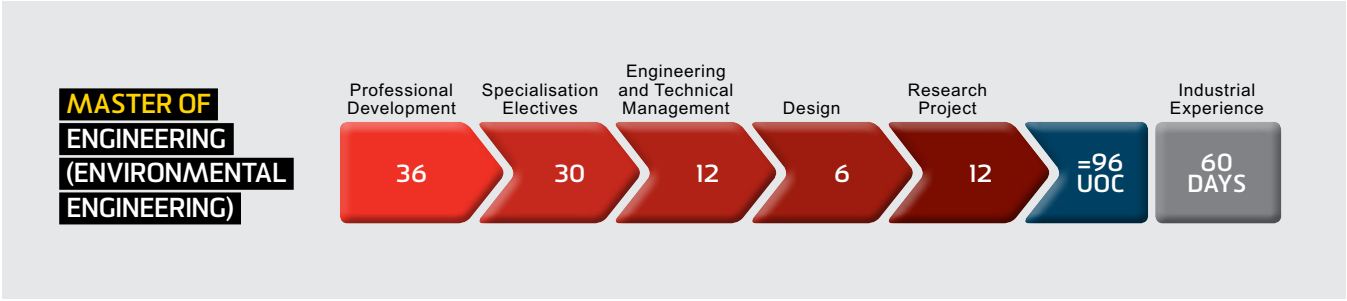
This two year Masters degree is especially designed for students who wish to increase their knowledge and skills in environmental engineering but who may not qualify for entry to the Master of Engineering Science.

Flexibility and choice are maintained throughout the program as many elective courses are offered. Students can specialise, and gain depth of knowledge across a broad range of areas, including project management, transport engineering, geotechnical engineering, water resources, waste and wastewater treatment. The program is awaiting provisional professional accreditation through Engineers Australia and is the perfect entry point for those who wish to move into the environmental engineering profession.

WHAT YOU WILL LEARN

The Masters degree requires students to complete at least 96 UOC including professional development courses in engineering management, analysis and design and engineering and the environment plus more in-depth environmental engineering specialisation and engineering management courses. A compulsory design course and research project plus 60 days of industrial experience mean students will have a firm grasp of all aspects of environmental engineering upon graduation.

TYPICAL PROGRAM STRUCTURE



Students can select a range of courses, subject to satisfying the prerequisite requirements.

YEAR 1 – PROFESSIONAL DEVELOPMENT

8 courses (48 UOC)*

MANAGEMENT

Select a **minimum** of two courses (12 UOC) of management courses from the following list:

- CVEN4101 Problem Solving for Engineers
- CVEN4102 Operations and Projects
- CVEN4103 Engineering Contracts.

ANALYSIS AND DESIGN

Select a minimum of two courses (12 UOC) of analysis and design courses from the following list:

- CVEN4202 Advanced Topics in Geotechnical Engineering or CVEN3202 Soil Mechanics
- CVEN4703 Advanced Water Quality Principles
- CVEN4205 Contaminated site engineering
- CVEN4507 Advanced Water Engineering or CVEN2501 Principles of Water Engineering
- CVEN4402 Transport Systems – Part 1: Network Analysis.

ENGINEERING AND THE ENVIRONMENT

Select a minimum of one course (6 UOC) of engineering and the environment courses from the following list:

- CVEN4701 Planning Sustainable Infrastructure
- CVEN3701 Environmental Frameworks, Economics and Law.

ELECTIVES

Select a maximum of two courses (12 UOC) of elective courses from the following list:

- CVEN4104 Sustainability in Construction
- CVEN4310 Deformation Monitoring Surveys
- CVEN4201 Rock and Slope Engineering
- CVEN4204 Ground Improvement and Monitoring Techniques.

* Students can select a range of courses, subject to satisfying the prerequisite requirements.

YEAR 2 – ADVANCED COURSES

8 courses (48 UOC)* including a compulsory design course and research project.

- CVEN9000 Design Practice
- CVEN9931 Masters Project A
- CVEN9932 Masters Project B.

Plus five courses (30 UOC) of elective courses taken from the following list (with **no more than** three courses (18 UOC) taken from any one discipline group):

Environmental Engineering:

- CVEN9888 Environmental Management
- CVEN9892 Sustainability Assessment and Risk Analysis in Water and Energy Systems Planning
- CVEN9855 Water and Wastewater Analysis
- CVEN9872 Solid Waste Management
- CVEN9881 Hazardous Waste Management
- CVEN9856 Water Treatment
- CVEN9857 Wastewater Treatment.

Project and Construction Management:

- CVEN9701 Engineering Economics and Financial Management
- CVEN9702 Project Planning and Control
- CVEN9706 Human Resources Management
- CVEN9707 Contracts Management
- CVEN9710 Management of Risk
- CVEN9712 Dispute Avoidance
- CVEN9714 Resource Management
- CVEN9717 Marketing in Technology and Engineering
- CVEN9718 Strategic Management for Engineering
- CVEN9720 Problem Solving and Decision Making
- CVEN9723 Design of Construction Operations
- CVEN9726 Legal Studies and Professional Practice
- CVEN9730 International Project Management
- CVEN9731 Project Management Framework.

Geotechnical Engineering:

- CVEN9511 Geotechnical Models and Site Investigation
- CVEN9512 Geomechanics
- CVEN9513 Advanced Foundation Engineering
- CVEN9514 Numerical Methods in Geotechnical Engineering
- CVEN9521 Slope Instability
- CVEN9522 Rock Engineering
- CVEN9523 Pavement Engineering
- CVEN9524 Geotechnical Engineering of Dams.

Transport Engineering:

- CVEN9405 Urban Transport Planning Practice
- CVEN9407 Transport Modelling
- CVEN9415 Transport Systems – Part 2: Queuing Theory
- CVEN9422 Traffic Management and Control.

Water Engineering:

- CVEN9610 Surface Water Hydrology
- CVEN9611 Urban Hydrology
- CVEN9612 Catchment and Water Resources Modelling
- CVEN9620 Channels, Rivers and Estuaries
- CVEN9630 Groundwater Engineering
- CVEN9640 Waves and Beaches
- CVEN9855 Water and Wastewater Analysis.

YEAR 2 – 60 DAYS OF INDUSTRIAL TRAINING

Students must complete ***60 days of Environmental Engineering related industrial experience.***

ENTRY REQUIREMENTS

Entry is open to students with a four year non-accredited (under the Washington Accord) Bachelor of Engineering degree or equivalent. Alternatively, eligible applicants include those who hold a three year Engineering Science degree, at least equivalent to the first three years of a relevant Engineering degree accredited under the Washington Accord.

PROFESSIONAL RECOGNITION

The Master of Engineering in Environmental Engineering is currently awaiting provisional professional accreditation by Engineers Australia.

DELIVERY MODE

Face-to-face teaching is our strength, all part of our campus experience. Certain courses are offered in intensive short course mode or by distance.

WHY UNSW ENGINEERING

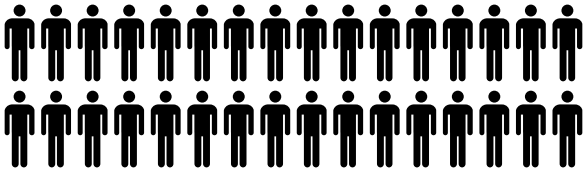
UNSW Engineering is the largest Engineering Faculty in Australia. We continue to foster and develop elite-level engineers across a broad range of disciplines exposing them to world-class innovation, cutting-edge research and dedicated teaching staff. As such, we are recognised as Australia's top Engineering university.*

ENTRUST US WITH YOUR FUTURE

- **CUTTING-EDGE PROGRAMS** – be inspired by our research-led, industry-relevant curriculum.
- **REAL-WORLD FOCUS** – continually updated programs ensure graduates are armed with the very latest knowledge and techniques to be able to stand at the top of their field.
- **FLEXIBILITY** – programs can be tailored to suit your interests, entry points twice a year, out-of-hours classes and distance learning options.

* Shanghai Jiao Tong University's Academic Ranking of World Universities in Engineering/Technology and Computer Sciences 2014.

in Australia according to Shanghai Jiao Tong University's Academic Ranking of World Universities in Engineering/ Technology and Computer Sciences 2014.



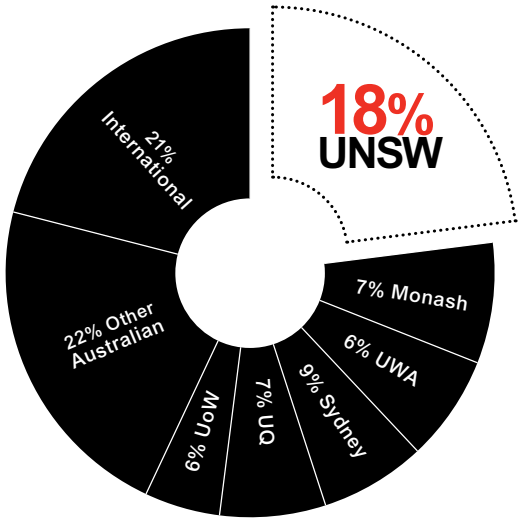
More technology entrepreneurs

than any other university in Australia.
(Crunchbase Report 2013)

QS World University Rankings

by Subjects 2014

18th in Civil, 29th in Computing, 33rd in Electrical, 37th in Mechanical and 46th in Chemical.

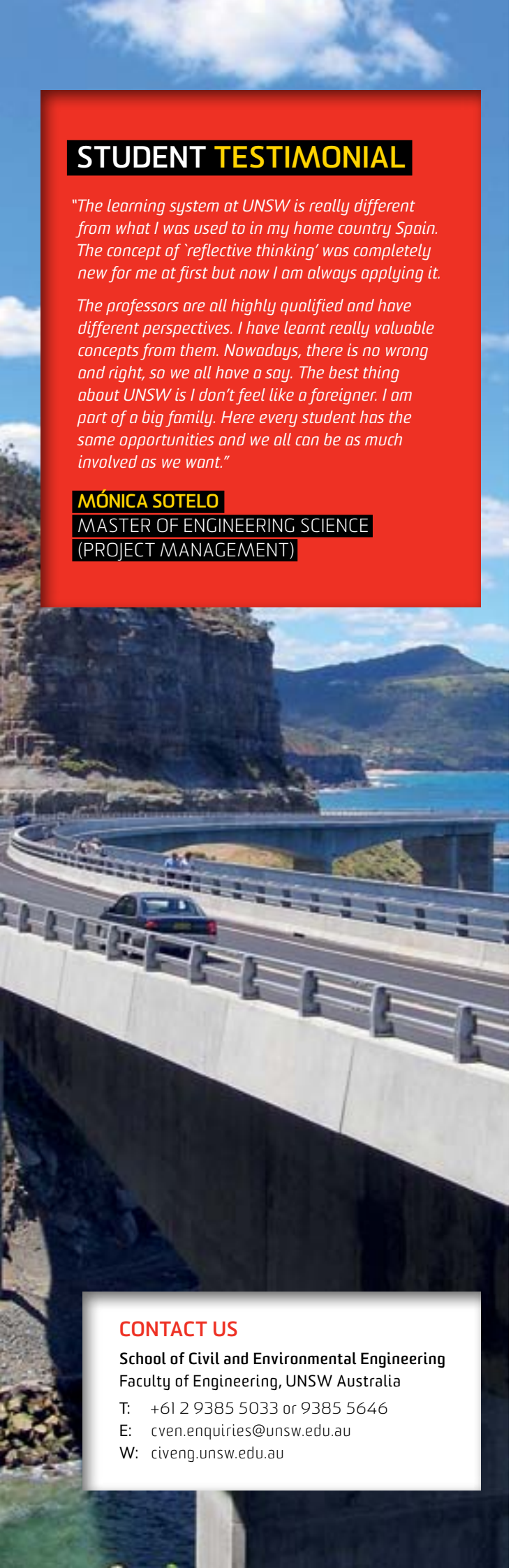


18% of the

top 100

most influential engineers in Australia are UNSW Graduates*

*Engineers Australia Top 100 list in 2014



STUDENT TESTIMONIAL

"The learning system at UNSW is really different from what I was used to in my home country Spain. The concept of `reflective thinking' was completely new for me at first but now I am always applying it.

The professors are all highly qualified and have different perspectives. I have learnt really valuable concepts from them. Nowadays, there is no wrong and right, so we all have a say. The best thing about UNSW is I don't feel like a foreigner. I am part of a big family. Here every student has the same opportunities and we all can be as much involved as we want."

MÓNICA SOTELO
MASTER OF ENGINEERING SCIENCE
(PROJECT MANAGEMENT)

CONTACT US

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Faculty of Engineering, UNSW Australia

T: +61 2 9385 5033 or 9385 5646
E: cven.enquiries@unsw.edu.au
W: civeng.unsw.edu.au

TAKING THE NEXT STEP

HOW TO APPLY

To gain entry to UNSW you'll need to successfully meet both the academic entry requirements and the English language requirements. For assistance with the application process, contact a UNSW official representative at ***international.unsw.edfu.au/contact-us***

Apply online at *apply.unsw.edu.au*
The UNSW Apply Online service has quick links to key information for applicants, including the application tracking service which allows you to check the progress of your application.

CLOSING DATES

Semester One (February): Applications must be lodged by 30 November.
Semester Two (July): Applications must be lodged by 30 May.
Not all programs have a Semester Two start date.

LATE APPLICATIONS

Late applications will be accepted after the closing dates subject to the availability of places. Please note that whilst UNSW endeavour to process applications as quickly as possible, due to time constraints it cannot be guaranteed that a late application will be processed in time for semester commencement.

INTERNATIONAL STUDENTS

Applications are made directly to UNSW Australia, via our Apply Online portal at ***apply.unsw.edu.au*** For more information on what you need and how to apply go to ***international.unsw.edu.au***

Most international students will require a student visa to study in Australia (application and processing of this visa may take some time). More information can be found at ***international.unsw.edu.au/living-sydney/visas/***

SCHOLARSHIPS

There are a number of scholarships available for eligible students. To find out more about available postgraduate scholarships, eligibility and application process go to ***scholarships.unsw.edu.au***

FEES

A postgraduate coursework fee calculator for both domestic and international students can be found at ***apply.unsw.edu.au***

ACCOMMODATION

UNSW offers a range of accommodation options, visit ***housing.unsw.edu.au*** for full details.

STUDENT LIFE

At UNSW there is an abundance of support available to students. To find out more about studying at UNSW, visit ***unsw.edu.au*** and search for Student Life.

* Shanghai Jiao Tong University's Academic Ranking of World Universities in Engineering/Technology and Computer Sciences 2014.

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