

Mining Engineering Postgraduate coursework programs

Never Stand Still

Engineering

Mining Engineering

YOUR FUTURE. YOUR CHOICE.

The best way to advance in the mining industry is by arming yourself with the latest skills and knowledge. So whether you're currently working in the industry, or planning to guide your career in that direction, postgraduate coursework programs can really make the world of difference.

SCHOOL OF MINING ENGINEERING

The School of Mining Engineering at UNSW Australia is one of the largest and most vibrant centres of tertiary mining education in the English-speaking world. The academic staff and guest lecturers are drawn from industry and have strong practical, educational and research experience that is integrated into the programs, providing students with real and relevant learning opportunities.

Programs are generally delivered in block mode at the School by academic or industry experts, with a number also delivered fully or partly online, to accommodate the needs of students engaged in full-time employment.

COURSEWORK PROGRAMS

- Master of Mining Engineering Graduate Diploma of Mining Engineering Graduate Certificate of Mining Engineering
- Master of Mine Geotechnical Engineering
 Graduate Diploma of Mine Geotechnical Engineer
- Graduate Diploma of Mine Ventilation.

POSTGRADUATE STUDY OPTIONS

PROGRAM OPTIONS	PROGRAM CODE	UNITS OF CREDIT	DURATION*	COMMENCE**
Master of Mining Engineering Mine Geomechanics specialisation Mine Management specialisation 	8335 MINEJS8335 MINEPS8335	72	1.5 years	Feb
Graduate Diploma of Mining EngineeringMine Geomechanics specialisationMine Management specialisation	5335 MINERS5335 MINEQS5335	48	1 year	Feb
Graduate Certificate of Mining Engineering	7335 MINEDS7335	24	0.5 year	Feb
Master of Mine Geotechnical EngineeringCoal Mine Strata Control specialisationUnderground Ground Control specialisation	8059 MINEUS8059 MINETS8059	72	1.5 years	Feb
Graduate Diploma of Mine Geotechnical EngineeringCoal Mine Strata Control specialisationUnderground Ground Control specialisation	5059 MINENS5059 MINEMS5059	48	1 year	Feb
Graduate Diploma of Mine Ventilation	5046	48	1 year	Feb

*Exemptions may be available for up to four courses (or 24 UOC) reducing the duration of some programs. Please contact School of Mining Engineering for more details about how you could reduce your program duration.

** All programs should commence in Semester One, however commencement in Semester Two is possible with written permission or at the School of Mining Engineering's discretion.

MASTER OF MINING ENGINEERING GRADUATE DIPLOMA OF MINING ENGINEERING GRADUATE CERTIFICATE OF MINING ENGINEERING

The **Master of Mining Engineering** provides advanced study in mining engineering, with various entry points and pathways of study depending on the student's background. Designed to cater for people with an engineering or technical background, the program can be undertaken on either a part-time or full-time basis.

The program provides an opportunity for mining engineering graduates and minerals industry professionals to continue their professional development in specialised areas. Students can choose the Masters program or enter via the Graduate Diploma and step up to the Masters at a later time.

There are two specialisations offered: Mine Geomechanics and Mine Management.

TYPICAL PROGRAM STRUCTURE

The courses are offered in block or distance format to allow employees of mining companies and associated service providers to attend on a part-time basis. The Graduate Diploma (Mine Management) specialisation can be completed fully in distance format. Some electives may only be offered every two years. See *mining.unsw.edu.au* for more information.

MINE MANAGEMENT SPECIALISATION



^ Students intending to articulate from the Graduate Diploma to the Masters in Mining Engineering are required to enroll in a research course.

CORE COURSES

MASTERS Five courses (30 UOC) GRADUATE DIPLOMA Four courses (24 UOC)

Foundation disciplinary:

- GSOE9400 Introduction to academic study skills (or equivalent course)
- MINE8101 Fundamentals of Mining Engineering.

Advanced disciplinary:

- MINE8120 Hazard Identification, Risk and Safety Management in Mining
- MINE8115 Mining Processes and Analysis
- MINE8440 Mining Industry Research Project I*.

* This course is not required for Graduate Diploma students unless they wish to articulate to the Masters program. It can then be taken as an elective.

ELECTIVES

MASTERS Seven courses (42 UOC) GRADUATE DIPLOMA Four courses (24 UOC)

Students can choose from the Advanced disciplinary courses below:

- MINE8445 Mining Industry Research Project II**
- LAWS8045 Mining and Resources Law
- MINE8130 Technology Management in Mining
- MINE8210 Management Systems Projects, Processes, Contracts, Contractors
- MINE8850 Mine Design and Feasibility
 - MINE8780 Environmental Management for the Mining Industry
- MINE8790 Advanced Mineral Economics and Project Evaluation
- MINE8760 Mine Geology and Geophysics for Mining Operations
- MINE8820 Mineral Processing
- MINE8910 Mine Water and Waste Management
- MINE8930 Uranium Mining Fundamentals
- MINE9910 Mine Ventilation.

A course calendar indicating current block and distance options for core and elective courses is available from the UNSW School of Mining Engineering website *mining.unsw.edu.au*

** This course is not available to Graduate Diploma students.

MINE GEOMECHANICS SPECIALISATION



^ Students intending to articulate from the Graduate Diploma to the Masters in Mining Engineering are required to enroll in a research course.

CORE COURSES

MASTERS Seven courses (42 UOC) GRADUATE DIPLOMA Six courses (36 UOC)

Foundation disciplinary:

- GSOE9400 Introduction to academic study skills (or equivalent course)
- MINE8101 Fundamentals of Mining Engineering.

Advanced disciplinary:

- MINE8120 Hazard Identification, Risk and Safety
 Management in Mining
- MINE8115 Mining Processes and Analysis
- MINE8440 Mining Industry Research Project I*
- MINE8140 Mining Geomechanics
- MINE8760 Mine Geology and Geophysics for Mining Operations.

This course is not required for Graduate Diploma students unless they wish to articulate to the Masters program. It can then be taken as an elective.

ELECTIVES

MASTERS Five courses (30 UOC)

GRADUATE DIPLOMA Two courses (12 UOC)

Students can choose from the advanced disciplinary courses below:

- MINE8130 Technology Management in Mining
- MINE8710 Mine Slope Stability
- MINE8720 Numerical Methods in Mine Geomechanics **
- MINE8750 Advanced Soil Mechanics and Mine Fill
- MINE8860 Drilling, Blasting and Machine Excavations
- MINE8910 Mine Water and Waste Management
- MINE8660 Geotechnical Engineering for Underground Hard Rock Mines**
- MINE8680 Geotechnical Data Collection and Analysis **
- MINE8690 Mining Geotechnical Project **.
- ** These courses are not available to Graduate Diploma students.

GRADUATE CERTIFICATE OF MINING ENGINEERING

3 courses (18 UOC)

Foundation disciplinary

- GSOE9010 Introduction to academic study skills
- MINE8101 Fundamentals of Mining Engineering.

Advanced disciplinary:

- MINE8120 Hazard Identification, Risk and Safety Management in Mining
- MINE8115 Mining Process and Analysis
- MINE8440 Mining Industry Research Project*.

* This course is not required for Graduate Diploma or Graduate Certificate students unless they wish to articulate to the Masters program. It can then be taken as an elective.

ELECTIVES

GRADUATE CERTIFICATE 1 course (6 UOC)

Students can choose from the Advanced disciplinary courses below:

- MINE8445 Mining Industry Research Project **
- LAWS8045 Mining and Resources Law
- MINE8130 Technology Management in Mining
- MINE8210 Management Systems Projects, Processes, Contracts, Contractors
- MINE8850 Mine Design and Feasibility
- MINE8780 Environmental Management for the Mining Industry
- MINE8790 Advanced Mineral Economics and Project Evaluation
- MINE8760 Mine Geology and Geophysics for Mining Operations
- MINE8820 Mineral Processing
- MINE8910 Mine Water and Waste Management
- MINE8930 Uranium Mining Fundamentals
- MINE9910 Mine Ventilation.

A course calendar indicating current block and distance options for core and elective courses is available from the UNSW School of Mining Engineering website *mining.unsw.edu.au*

ENTRY REQUIREMENTS

Masters: Students must have a recognised four year Bachelor of Mining Engineering degree or four year Bachelor of Engineering Geology, Civil Engineering or Geotechnical Engineering with at least an average 65% and no course fails. Experience in the mining industry will also be highly regarded. Graduate Diploma: Students need a four year degree in Mining Engineering or related engineering or physical sciences discipline from a recognised institution, or a three year degree plus a minimum of one year relevant industry experience. Graduate Certificate of Mining Engineering (LOCAL **STUDENTS ONLY):** The School of Mining Engineering offers a Graduate Certificate in Mining Engineering to allow a more flexible entry mode for applicants who have limited tertiary qualifications. Admission will be considered on an individual basis and will be based on academic qualifications and level of experience within the mining industry. Students with at least four years of relevant responsible industry experience and vocational certificates may also gain entry with permission based on a portfolio and interview. Students may be eligible to upgrade to a Graduate Diploma depending upon satisfactory academic progress. This usually requires maintaining at least a credit average in each course attempted.

PROFESSIONAL RECOGNITION

Mining engineering is an international profession with many of our graduates employed with mining companies operating in South East Asia, Africa, South and North America and Europe. Mining engineering graduates are trained to be versatile, adaptable and responsive to change in a physically and mentally challenging career. Our Graduate Diploma in Mining Engineering is considered a prerequisite qualification for state-based mine safety regulators to gauge competency for mine manager's certificates.

MASTER OF MINE GEOTECHNICAL ENGINEERING

AND GRADUATE DIPLOMA OF MINE GEOTECHNICAL ENGINEERING

These programs are for local and international students. International students should note this program does not allow them to enrol on a student visa.

This new specialist program is designed for those who currently work within the underground hard rock or underground coal mining industry and who may have particular responsibilities in the field of strata control. It has been designed to cater for people with both engineering and scientific backgrounds and may be undertaken on either a part-time or full-time basis.

For entry into the Masters program, students need to first complete the Graduate Diploma, which is also an option if they don't wish to invest the time in the Masters or would like a taste of postgraduate education.

There are two specialisations offered: Underground Ground Control and Coal Mine Strata Control.

TYPICAL PROGRAM STRUCTURE

Students study fundamental principles of rock mechanics and geotechnical engineering, followed by a comprehensive coverage of practical strata control applications. The program is offered in a flexible delivery format, with a large component available in a distance format, plus a limited number of face-to-face workshops and sessions and a research project. The Graduate Diploma is offered on a part-time only basis to industry personnel who have access to an underground hard rock mine and who satisfy the program entry requirements. See *mining.unsw.edu.au* for more information.

UNDERGROUND GROUND CONTROL SPECIALISATION



CORE COURSES

MASTERS 6 courses (36 UOC) GRADUATE DIPLOMA 6 courses (36 UOC)

Foundation disciplinary:

- MINE8140 Mining Geomechanics
- MINE8760 Geology and Geophysics for Mining Operations
- MINE8680 Geotechnical Data Collection and Analysis.

Advanced disciplinary:

- MINE8120 Hazard ID, Risk and Safety Management
- MINE8660 Geotechnical Engineering for Underground Hard Rock Mines
- MINE8690 Mining Geotechnical Project (Research specific to Underground Ground Control).

ELECTIVES

MASTERS 4 courses (24 UOC) GRADUATE DIPLOMA 2 courses (12 UOC)

Students can choose from:

- MINE8860 Drilling, Blasting and Machine Excavation
- MINE8720 Numerical Methods in Mine Geomechanics
- MINE8640 Geotechnical Disasters in Hard Rock Mines
- PLUS a maximum of one non-geotechnical MINE course OR a civil engineering geotechnical course may be accepted as an elective in this stream, subject to approval of the Program Authority at the time of enrolment.

Please note that some electives may only be offered every two years. Course timetables are available from *mining.unsw.edu.au*

RESEARCH (12 UOC)

A research thesis specific to Underground Ground Control is required. This includes the core course MINE8690.

COAL MINE STRATA CONTROL SPECIALISATION



^ Students intending to articulate from the Graduate Diploma to the Masters in Mining Engineering are required to enroll in a research course.

CORE COURSES

MASTERS 8 courses (48 UOC) GRADUATE DIPLOMA 8 courses (48 UOC)

Foundation disciplinary:

- MNNG5010 Fundamentals of Rock Behaviour
- MNNG5020 Geotechnical Assessment
- MINE8680 Geotechnical Data Collection and Analysis.

Advanced disciplinary:

- MNNG5030 Mining Excavations in Rock
- MNNG5040 Applied Geomechanics (coal)
- MNNG5050 Ground Control Principles (coal)
- MNNG5060 Operational Geotechnical Management
- MINE8690 Mining Geotechnical Project (research specific to Coal Mine Strata Control).

ELECTIVES

MASTERS 2 courses (12 UOC) GRADUATE DIPLOMA no electives

Students can choose from:

- MINE8860 Drilling, Blasting and Machine Excavation
- MINE8720 Numerical Methods in Mine Geomechanics
- **PLUS** a maximum of one non-geotechnical MINE course **OR** a civil engineering geotechnical course may be accepted as an elective in this stream, subject to approval of the Program Authority at the time of enrolment.

Please note that some electives may only be offered every two years. Course timetable is available from *mining.unsw.edu.au*

RESEARCH (12 UOC)

A research thesis specific to Coal Mine Strata Control is required for the Masters. This includes the core course MINE8690 (above) and two additional research project courses:

- MINE8440 Mining industry research project I
- MINE8445 Mining industry research project II.

ENTRY REQUIREMENTS

Masters: Students need to have completed the Graduate Diploma in Mine Geotechnical Engineering with a minimum of 70% and no course fails. There is no direct entry path for this program, however, in rare exceptional circumstances, students who can demonstrate equivalent prior learning may be approved an alternative entry pathway by written permission of the Head of School or Director of Postgraduate Studies (Coursework).

Graduate Diploma: Students need a three or four year degree in Mining or Civil Engineering or a Geosciences discipline from a recognised institution. Significant industry experience in underground mining is strongly recommended. Those with at least two years of relevant responsible industry experience may also gain entry with permission, based on portfolio and interview. See *mining.unsw.edu.au* for more information.

STUDENT TESTIMONIAL

"The variety of subjects offered in this program, along with the flexible form of delivery and interactive style of learning, makes the degree ideal for those who have come from a broad range of engineering and/or science backgrounds. The degree also provides exposure to other areas of mining that many specialised engineers wouldn't otherwise be able to gain."

JAMES HARVEY MASTER OF MINING ENGINEERING (MANAGEMENT)

GRADUATE DIPLOMA OF MINE VENTILATION

This flexible program is delivered in a distance format and provides professional development in mine ventilation and environment for mining engineers and others who work in the mining industry. The program covers the needs of both the metalliferous and coal mining sectors.

Options in the Diploma include the accredited programs offered by UNSW for the appointment of Statutory Coal Mine Ventilation Officers in both NSW and QLD. The course contents have been developed from standard texts, industry guidelines and case studies. These are delivered from both a theoretical and operational perspective with the aim that course contents will be immediately relevant to industry.

TYPICAL PROGRAM STRUCTURE

This program, delivered in a distance, flexible format, is based on a theoretical and operational perspective with the aim that course contents will be immediately relevant to industry. As this is a professional development course, it is essential that the student is working at a mine site because assessments are geared to practical evaluation of mine ventilation systems. Some electives may only be offered every two years. See *mining.unsw.edu.au* for more information.



* This program is for local and international students. International students should note this program does not allow them to enrol on a student visa.

CORE COURSES

GRADUATE DIPLOMA 8 courses (48 UOC)

Foundation disciplinary:

- MNNG*/MINE9901 Ventilation and Mine Services
- MNNG*/MINE9902 Environmental Contaminants.

Advanced disciplinary:

- MNNG/MINE9903 Heat in Underground Mines
- MNNG*/MINE9904 Ventilation System Management
- MNNG/MINE9921 Mine Ventilation Legislation
- MNNG*/MINE9905 Mine Hazards and Control
- MNNG/MINE9920 Spontaneous Combustion and Reactive Ground
- MNNG/MINE9922 Mine Ventilation Practices.

* Four of these courses are offered for Ventilation Officers professional development

ENTRY REQUIREMENTS

Entry to the Graduate Diploma requires a degree in mining engineering and at least one year experience underground in coal or metal mining, or a degree in a related discipline and at least two years underground mining experience. Special entry may also be granted for those with at least three years relevant responsible work experience, and will be considered based on a portfolio supporting the application and entry interview. See *mining.unsw.edu.au* for more information.

Applicants who have completed the Statutory Ventilation Officers (VO) professional development program are given 50% RPL for this Graduate Diploma.

PROFESSIONAL RECOGNITION

The program is supported by the UNSW Minerals Industry Advisory Council (MIAC) and MTEC, the tertiary minerals education arm of the Minerals Council of Australia.

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.*

WHY NOT JOIN US?

- **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.

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.edu.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.aullivingsydney/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. CRICOS Provider Code: NSW 00098G



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

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





18% of the **top 100** most influential engineers in Australia are UNSW Graduates* *Engineers Australia Top 100 list in 2014

CONTACT US

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