

# Faculty of Engineering

## Member Units

School of Civil, Mining and Environmental Engineering  
School of Engineering Physics  
School of Mechanical, Materials and Mechatronic Engineering

## Degrees Offered

### Research

Doctor of Philosophy  
Master of Engineering - Research  
Master of Science – Research (Physics)

### Coursework

Master of Engineering

- Civil Engineering
- Environmental Engineering
- Materials Engineering
- Mechanical Engineering
- Mining Engineering
- Mechatronics

Master of Engineering Practice

- Bulk Solids and Particulate Technologies

Master of Engineering Practice

Master of Engineering Management

Master of Engineering Asset Management

Master of Welding Engineering

Master of Medical Radiation Physics

Graduate Diploma in Engineering

Graduate Diploma in Materials Welding and Joining

Graduate Diploma in Medical Radiation Physics

Graduate Diploma in Science (Physics)

Graduate Certificate in Engineering

Graduate Certificate of Engineering Asset Management

For tuition fee information please see the following:

Domestic - <http://www.uow.edu.au/student/finances/studentcontributions.html>  
International - <http://www.uow.edu.au/prospective/international/fees/>

This publication contains information which is current at December 2005. The University takes all due care to ensure the accuracy and currency of this information, but reserves the right to vary any information contained in this publication without notice. In particular, subject availability may change after the publication of the Handbook. For up-to-date subject information, students are advised to consult the online subject descriptions prior to enrolment, available at [www.uow.edu.au/handbook/](http://www.uow.edu.au/handbook/).

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## Doctor of Philosophy

Testamur Title of Degree:	Doctor of Philosophy
Abbreviation:	PhD
Home Faculty:	Faculty of Engineering
Duration:	3yrs full-time or part-time equivalent
Total Credit Points:	48 credit points per year
Entry Requirements:	Bachelor degree in a relevant discipline with Honours Class II, Division 2 or higher.
Delivery Mode:	Research
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	201
CRICOS Code:	001245D

### Overview

Doctor of Philosophy (PhD) candidates undertake in-depth research in order to make an original contribution to the body of knowledge in their area of interest. This qualification can lead to, or enhance an academic career, and is also highly regarded by public and private sector employers. A thesis containing the candidate's research will be presented for examination at the end of the study.

### Current research areas are listed below:

#### *Civil Engineering*

- Steel and concrete structures
- Composite steel-concrete structures
- Bridge engineering
- Solid and rock mechanics
- Foundation engineering, including railways
- Slope stability and reliability analysis
- Soft ground improvement technology
- Reinforced earth
- Dam and embankment engineering
- Finite element and other numerical methods
- Structural dynamics
- Cementitious materials for construction
- Flood studies, hydraulics and hydrology
- Water quality engineering
- Geo-environmental studies

#### *Environmental Engineering*

- Water quality engineering
- Environmental hydraulics and unit processes
- Pollution control engineering
- Water quality and quantity modelling of catchments, rivers and lakes
- Soil erosion and sediment transport
- Environmental pollution modelling
- Recycling and waste management
- Environmental geotechnology
- Solid-liquid separation processes
- Transport and the environment

#### *Materials Engineering*

##### Steel Processing and Products:

- Polymer coating adhesion
- Mechanical properties of polymer coatings
- Surface properties of polymers
- Peritectic phase transformation: mechanism and kinetics
- Development of in-situ observation techniques
- Kinetics of phase transformations in zincalume alloy systems
- Property/microstructure relationships
- Process optimisation in direct reduction of iron
- Thermo-mechanical processing, including HSLA steels
- Corrosion of steelmaking refractories
- Slag properties and behaviour

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**Superconducting and Electronic Materials:**

Theory and mechanism of superconductors  
Phase relation, phase evolution and chemistry of superconductors  
Single crystal growth and study of intrinsic properties  
Fabrication of bulk, wires and tapes superconductors  
Critical current density, transport mechanism and flux pinning  
Studies on structure, microstructure and stability  
Colossal magnetoresistance materials  
Spintronic materials  
High energy batteries for electric vehicles  
Solid-state rechargeable lithium batteries for telecommunication and portable electronic devices  
Developing new cathode materials for lithium-ion batteries using Australian mineral resources  
Investigation of nano-materials for use in lithium rechargeable batteries  
Composite cathode materials for lithium ion batteries using chemical coating technique  
Hydrogen storage materials  
Nickel-metal hydride batteries  
Processing of thin films  
Investigation of superconductor thin films  
Nanofabrication of novel multilayer materials  
Coated conductors  
Nanostructure of electronic materials

**Ceramic and Refractory Materials:**

Sintering kinetics  
High temperature degradation  
Extrusion of resin-bonded ceramics  
Processing of refractories

**Intelligent Polymers:**

Artificial muscles  
Chemical and physical sensors  
Electronic textiles

**Nano-materials:**

Synthesis and characterisation of carbon nanotubes  
High energy ball milling  
Structure and properties of nanocrystalline materials

**Welding and Joining/Surface Engineering:**

Structure and properties of welded metals  
Weld metal cracking  
Post weld heat treatment  
Weldability of creep resistant steels  
Brazing and diffusion bonding  
Fusion welding of coated steels  
Surface engineering of materials  
Wear and surface property testing  
Physical vapour deposition processing of metals  
Ion implantation  
Microwave processing of materials  
Solidification  
Welding automation  
Welding process control  
Welding fume dispersion and control  
In process monitoring  
Laser hybrid welding  
Magnetically impelled arc butt welding

***Mechanical Engineering (includes Mechatronics)***

**Applied Mechanics:**

Bio-mechanics  
Solid mechanics  
Computational fluid mechanics  
Jet cooling in industrial applications  
Finite element analysis  
Natural and hybrid ventilation of buildings  
Industrial ventilation systems  
Renewable energy systems  
Wave energy conversion

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## Course Information

Small wind energy systems  
Mechanical engineering design  
Heavy vehicle and rail dynamics  
Railway engineering  
Rolling mill technology  
Solar thermal system analysis and design  
Solid mechanics of elastic and magneto-elastic bodies  
System identification and control  
Tribology-bearing friction and wear  
Alternative fuels  
Novel IC engines

### **Manufacturing and Mechatronics:**

Sensors and actuators  
Smart materials and structures  
MEMS and Nanotechnology  
Laser welding and surfacing  
Automated pipe welding  
Robotic repair technology  
Novel control of arc processes  
Virtual reality weld simulator  
Magnetic impelled arc butt-welding  
Automated QC and reliability engineering  
Chip control in automated manufacture  
Expert/knowledge system in automated machining  
Intelligent manufacturing systems  
Monitoring/diagnosis of manufacturing processes and machinery conditions  
Integrated CAD/CAM  
Maintenance management

### **Bulk Materials Handling:**

Prediction of bin wall loads and flow rates  
Feeding and discharging systems including pressurised systems  
Dust and fume control  
Pneumatic conveying  
Computer simulation of discrete particles  
Biomass handling and feeding systems  
Fluidisation and deaeration

### ***Mining Engineering***

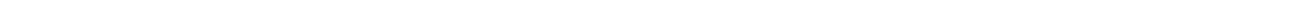
Rock mechanics  
Surface mining  
Mine simulation, planning and design  
Mine safety and mine ventilation  
Geostatistics  
Computer applications in mining engineering  
Mine water  
Environmental impact of mining

### ***Physics***

Astronomy and astrophysics  
Observational studies of star formation  
Comparative planetology: Mars and Venus  
Asteroid and cometary mining  
Laser spectroscopy  
Scattering of light by solids  
Solid state spectroscopy of impurities in semiconductors  
Studies of electronic wave functions in solids  
Theoretical astrophysics - galaxy formation, gas dynamics  
Terahertz optoelectronics  
Spintronics  
Thermionics  
Quantum transport in nanostructures  
Resonant tunnelling  
Far-infrared spectroscopy  
Thermal transport in layered structures  
Many body theory

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Zeeman spectroscopy  
Piezo spectroscopy



**Medical Radiation Physics:**

- Semiconductor radiation detectors
- Radiation transport and dosimetry
- Radiation therapy
- Medical imaging and radiology
- PET and SPECT instrumentation
- High Energy Physics Detectors
- Proton Therapy

## Master of Engineering - Research

Testamur Title of Degree:	Master of Engineering - Research
Abbreviation:	MEng - Res
Home Faculty:	Faculty of Engineering
Engineering Disciplines:	Civil, Environmental, Materials, Mechanical, Mechatronics, Mining
Duration:	1.5 yrs full-time or part-time equivalent
Total Credit Points:	72 credit points
Entry Requirements:	Relevant degree with Honours Class III or above
Delivery Mode:	Research/Coursework
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	1303
CRICOS Code:	042554G

### Overview

The Master of Engineering degree by research is intended for engineers qualified and interested in specific engineering problems. The degree comprises a 48 credit point research thesis and 24 credit points of coursework. Coursework comprises the six credit point subject ENGG951 Engineering Project Management, plus 18 credit points of elective subjects chosen from the relevant Master of Engineering program.

Advanced standing for some or the entire coursework component may be granted on demonstrated research skills. Evidence of these skills would normally be a Bachelor of Engineering (Honours Class II Division 2 or better) and/or an appropriate Masters Coursework degree.

For current research areas refer to the PhD program above.

## Master of Science - Research

Testamur Title of Degree:	Master of Science - Research
Abbreviation:	MSc - Res
Home Faculty:	Faculty of Engineering
Engineering School:	Engineering Physics
Duration:	1.5 yrs full-time or part-time equivalent
Total Credit Points:	72 credit points
Entry Requirements:	Degree in Physics, or a Graduate Diploma in Science (Physics) or approved equivalent qualification
Delivery Mode:	Research/Coursework
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	1304
CRICOS Code:	042555F

### Overview

The Master of Science degree by research equips candidates with superior skills in research design and methodology in preparation for leadership roles in their chosen field. The degree comprises a 48 credit point research thesis and 24 credit points of coursework. Advanced standing for some, or all of the coursework component may be granted on demonstrated research skills.

Students entering with a degree below Honours Class II, Division 2 will complete the 48 credit point thesis and 24 credit point combination of subjects chosen from the remaining Graduate Subjects below, and the list of undergraduate Physics subjects. These subjects will be chosen in consultation with, and approved by the Physics Discipline Advisor.

For current research areas refer to the PhD program above.

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## Course Program

Subjects	Credit Points
<b>Core Subjects</b>	
PHYS401 Theoretical Mechanics and Electromagnetism	8
PHYS441 Advanced Astrophysics	4
PHYS444 Quantum Mechanics	8
PHYS446 Solid State Physics	8
PHYS910 Advanced Project in Physics A	6
PHYS946 Advanced Solid State Physics	6
PHYS947 Special Topics in Physics A	6
PHYS948 Physics of Imaging	6
PHYS952 Radiation and Radiotherapy Physics	8
PHYS953 Medical Imaging and Nuclear Medicine	8
PHYS954 Radiobiology and Radiation Protection	8
PHYS960 Advanced Project in Physics B	6
PHYS997 Special Topics in Physics B	6

## Master of Engineering (Civil Engineering)

Testamur Title of Degree:	Master of Engineering (Civil Engineering)
Abbreviation:	MEng
Home Faculty:	Faculty of Engineering
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	Bachelor of Engineering with honours at Class III or higher from this University, or an approved equivalent qualification
Delivery Mode:	Coursework/Dissertation
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	1403
CRICOS Code:	042657M

### Overview

The Master of Engineering allows the student to combine specialist postgraduate subjects according to his or her undergraduate background, with project work. The program comprises a 24 credit point dissertation and at least 24 credit points of coursework. The dissertation typically requires rigorous research in a specialised area – normally in the area of coursework components undertaken.

### Course Program

Subjects	Credit Points
<b>Core Subject</b>	
ENGG945 Dissertation	24

#### Elective Subjects

Four 6 credit point subjects to be agreed with the Head of School of Civil, Mining and Environmental Engineering (or delegated Discipline Advisor), taken primarily from 900 level subjects in the School and/or ENGG subjects.

Note: Not all subjects may be available in any one year – refer Subject Listing.

## Master of Engineering (Environmental Engineering)

Testamur Title of Degree:	Master of Engineering (Environmental Engineering)
Abbreviation:	MEng
Home Faculty:	Faculty of Engineering
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	Bachelor of Engineering with honours at Class III or higher from this University, or an approved equivalent qualification
Delivery Mode:	Coursework/Dissertation
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	1403
CRICOS Code:	042657M

### Overview

The Master of Engineering allows the student to combine specialist postgraduate subjects, according to his or her undergraduate background, with project work. The program comprises a 24 credit point dissertation and at least 24 credit points of coursework. The dissertation typically requires rigorous research in a specialised area – normally in the area of coursework components undertaken.

### Course Program

Subjects	Credit Points
<b>Core Subject</b>	
ENGG945      Dissertation	24

#### Elective Subjects

*Four 6 credit point subjects to be agreed with the Head of School of Civil, Mining and Environmental Engineering (or delegated Discipline Advisor), taken primarily from 900 level subjects in the School and/or ENGG subjects.*

*Note: Not all subjects may be available in any one year – refer Subject Listing.*

## Master of Engineering (Materials Engineering)

Testamur Title of Degree:	Master of Engineering (Materials Engineering)
Abbreviation:	MEng
Home Faculty:	Faculty of Engineering
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	Bachelor of Engineering with honours at Class III or higher from this University, or an approved equivalent qualification
Delivery Mode:	Coursework/Dissertation
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	1403
CRICOS Code:	042657M

### Overview

The Master of Engineering allows the student to combine specialist postgraduate subjects, according to his or her undergraduate background, with project work. The program comprises a 24 credit point dissertation and at least 24 credit points of coursework. The dissertation typically requires rigorous research in a specialised area – normally in the area of coursework components undertaken.

### Course Program

Subjects	Credit Points
<b>Core Subject</b>	
ENGG945      Dissertation	24

#### Elective Subjects

*Four 6 credit point subjects to be agreed with the Head of School of Mechanical, Materials and Mechatronics Engineering (or delegated Discipline Advisor), taken primarily from 900 level subjects in the School and/or ENGG subjects.*

*Note: Not all subjects may be available in any one year – refer Subject Listing.*



## Master of Engineering (Mechanical Engineering)

Testamur Title of Degree:	Master of Engineering (Mechanical Engineering)
Abbreviation:	MEng
Home Faculty:	Faculty of Engineering
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	Bachelor of Engineering with honours at Class III or higher from this University, or an approved equivalent qualification
Delivery Mode:	Coursework/Dissertation
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	1403
CRICOS Code:	042657M

### Overview

The Master of Engineering allows the student to combine specialist postgraduate subjects, according to his or her undergraduate background, with project work. The program comprises a 24 credit point dissertation and at least 24 credit points of coursework. The dissertation typically requires rigorous research in a specialised area – normally in the area of coursework components undertaken.

### Course Program

Subjects	Credit Points
<b>Core Subject</b>	
ENGG945      Dissertation	24

#### Elective Subjects

*Four 6 credit point subjects to be agreed with the Head of School of Mechanical, Materials and Mechatronics Engineering (or delegated Discipline Advisor), taken primarily from 900 level subjects in the School and/or ENGG subjects.*

*Note: Not all subjects may be available in any one year – refer Subject Listing.*

## Master of Engineering (Mechatronics)

Testamur Title of Degree:	Master of Engineering (Mechatronics)
Abbreviation:	MEng
Home Faculty:	Faculty of Engineering
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	Bachelor of Engineering with honours at Class III or higher from this University, or an approved equivalent qualification
Delivery Mode:	Coursework/Dissertation
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	1403
CRICOS Code:	042657M

### Overview

The Master of Engineering allows the student to combine specialist postgraduate subjects, according to his or her undergraduate background, with project work. The program comprises a 24 credit point dissertation and at least 24 credit points of coursework. The dissertation typically requires rigorous research in a specialised area – normally in the area of coursework components undertaken.

### Course Program

Subjects	Credit Points
<b>Core Subject</b>	
ENGG945      Dissertation	24

#### Elective Subjects

*Four 6 credit point subjects to be agreed with the Head of School of Mechanical, Materials and Mechatronics Engineering (or delegated Discipline Advisor), taken primarily from 900 level subjects in the School and/or ECTE or ENGG subjects.*

*Note: Not all subjects may be available in any one year – refer Subject Listing.*

## Master of Engineering (Mining Engineering)

Testamur Title of Degree:	Master of Engineering (Mining Engineering)
Abbreviation:	MEng
Home Faculty:	Faculty of Engineering
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	Bachelor of Engineering with honours at Class III or higher from this University, or an approved equivalent qualification
Delivery Mode:	Coursework/Dissertation
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	1403
CRICOS Code:	042657M

### Overview

The Master of Engineering allows the student to combine specialist postgraduate subjects according to his or her undergraduate background, with project work.

The program comprises a 24 credit point dissertation and at least 24 credit points of coursework. The dissertation typically requires rigorous research in a specialised area – normally in the area of coursework components undertaken.

### Course Program

Subjects	Credit Points
<b>Core Subject</b>	
ENGG945      Dissertation	24

#### Elective Subjects

*Four 6 credit point subjects to be agreed with the Head of School of Civil, Mining and Environmental Engineering (or delegated Discipline Advisor), taken primarily from 900 level subjects in the School and/or ENGG subjects.*

*Note: Not all subjects may be available in any one year – refer Subject Listing.*

## Master of Engineering Practice

Testamur Title of Degree:	Master of Engineering Practice
Abbreviation:	MEngPrac
Home Faculty:	Faculty of Engineering
Engineering Discipline:	Refer to Engineering streams below
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	A 4 yr Bachelor of Engineering degree
Delivery Mode:	Coursework
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	590
CRICOS Code:	020204M

### Overview

The Master of Engineering Practice has been designed to meet the needs of engineering leaders of the future. This program allows practicing engineers to build on, update and acquire additional knowledge in areas not covered in their first degree.

This is a 48 credit point program. The core program comprises four, 6 credit point subjects. The remaining 24 credit points can be selected from the Engineering Postgraduate subject list; or for students wishing to have a specialisation recorded on their degree, 24 credit points of approved elective subjects from one of the engineering streams listed below.

Students can apply to undertake the Master of Engineering Practice in two streams. Students would complete the core program and two 24 credit point programs of elective subjects. This is a 72 credit point program and would normally take 1.5 to 2 years to complete. Both specialisations would be recorded on the testamur.

With approval of the Course Advisor, students can undertake a 12 credit point dissertation as part of the elective subjects. The dissertation, ENGG940 Dissertation, is a research project allowing students to pursue a particular area in depth. The

dissertation develops skills in information retrieval, project planning and organisation analysis, problem solving, and effective communication of results.

Where insufficient subjects are offered in a particular stream and/or where students are not able to provide assumed knowledge for available electives, the course advisor may substitute ENGG subjects, providing at least three subjects are taken from the stream under consideration.

## Course Program

Subjects	Credit Points
<b>Core Subjects</b>	
ENGG950 Innovation and Design	6
ENGG951 Engineering Project Management	6
ENGG952 Engineering Computing	6
ENGG954 Strategic Management for Engineers and Technologists	6
<b>Elective Subjects – Asset Management</b>	
ENGG953 Modelling of Engineering Management Systems	6
ENGG956 Financial Management for Engineered Assets	6
ENGG957 Project Implementation and Outsourcing	6
ENGG958 Life-Cycle and Risk Management	6
ENGG960 Maintenance Requirements Analysis	6
ENGG961 Systems Engineering	6
<b>Elective Subjects – Civil Engineering</b>	
CIVL904 Highway Materials	6
CIVL909 Advanced Foundation Engineering	6
CIVL912 Engineering Hydrology	6
CIVL916 Research Topics in Civil Engineering	6
CIVL980 Advanced Computer Applications	6
CIVL981 Special Topic A	6
ENVE929 Site Contamination and Remediation Technologies	6
<b>Elective Subjects – Environmental Engineering</b>	
ENGG953 Modelling of Engineering Management Systems	6
ENGG956 Financial Management for Engineered Assets	6
ENVE923 Industrial Waste Engineering and Cleaner Production	6
ENVE924 Solid and Hazardous Waste Management	6
ENVE925 Water Quality Engineering and Management	6
ENVE926 Air and Noise Pollution Management	6
ENVE927 Environmental Engineering Processes Design	6
ENVE928 Design of Urban Water Systems	6
ENVE929 Site Contamination and Remediation Technologies	6
ENVE930 Coastal, River and Groundwater Engineering	6
ENVE931 Membrane Processes and Applications	6
MECH979 Sustainable Transport and Engine Technology	6
<b>Elective Subjects – Manufacturing Engineering</b>	
ENGG953 Modelling of Engineering Management Systems	6
ENGG956 Financial Management for Engineered Assets	6
MATL901 Special Topic in Materials 1	6
MECH934 Advanced Manufacturing Processes	6
MECH935 Integrated Manufacturing Systems	6
MECH949 Advanced Computer Control of Machines and Processes	6
MECH950 Advanced Robotics	6
TBS908 Supply Chain Management	6
TBS926 Manufacturing Management	6
<b>Elective Subjects – Materials Engineering</b>	
ENGG953 Modelling of Engineering Management Systems	6
ENGG956 Financial Management for Engineered Assets	6
MATL901 Special Topic in Materials 1	6
MATL902 Special Topic B	6
MATL903 Recent Developments in Materials	6
MATL905 Metallic Materials	6
MATL906 Ceramic Materials	6
MATL907 Polymeric Materials	6
MATL952 Performance of Materials B	6
<b>Elective Subjects – Mechanical Engineering</b>	
ENGG953 Modelling of Engineering Management Systems	6

## Course Information

ENGG956	Financial Management for Engineered Assets	6
MECH913	Pneumatic Transport of Bulk Solids	6
MECH918	Sustainable Energy in Buildings	6
MECH919	Advanced Topics in Mechanical Engineering 1	6
MECH928	Finite Element Techniques in Mechanical Engineering	6
MECH934	Advanced Manufacturing Processes	6
MECH935	Integrated Manufacturing Systems	6
MECH948	Sustainable Energy Technologies	6
MECH949	Advanced Computer Control of Machines and Processes	6
MECH979	Sustainable Transport and Engine Technology	6
<b>Elective Subjects - Mechatronics</b>		
ECTE912	DC-Sourced Power Electronics	6
ECTE925	Industrial Drives and Actuators	6
ECTE931	Real-time Computing	6
ECTE941	Intelligent Control	6
ENGG953	Modelling of Engineering Management Systems	6
ENGG956	Financial Management for Engineered Assets	6
MATL901	Special Topic in Materials 1	6
MECH935	Integrated Manufacturing Systems	6
MECH941	Micro/Nano Robotic Systems	6
MECH949	Advanced Computer Control of Machines and Processes	6
MECH950	Advanced Robotics	6
<b>Elective Subjects – Mining Engineering</b>		
MINE902	Advanced Studies in Mining Engineering	6
MINE903	Simulation of Mining Operations and Problems	6
MINE904	Rock Mechanics	6
MINE905	Environmental Control in Mines	6
MINE906	Mining Engineering Techniques	6
<b>Elective Subjects – Resource Management*</b>		
MINE916	Mineral Valuation, Risk Analysis	6
MINE917	Mineral Economics	6
MINE918	Commodity Analysis	6
MINE919	Natural Resource Policy	6
<b>Elective Subjects – Steel Processing and Products*</b>		
ENGG931	Steel Products and their Production	6
ENGG932	Rolling Technology	6
ENGG933	Coating Technology	6
ENGG934	Steelmaking	6
ENGG935	Casting	6

*Note: Not all subjects available in any one year – refer Subject Listing.*

*\*Only available on a part-time basis*

## Master of Engineering Management

Testamur Title of Degree:	Master of Engineering Management
Abbreviation:	MEM
Home Faculty:	Faculty of Engineering
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	A Bachelor of Engineering degree or other qualifications together with at least 4 years experience in a senior management position will be considered
Delivery Mode:	Coursework
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	
CRICOS Code:	051350M

### Overview

The Master of Engineering Management is aimed at Engineers, and others who see their careers progressing into management. The course provides them with a very strong grounding in some of the most modern management thinking that is applicable to Engineering and Manufacturing Industries. Graduates of this degree will become empowered to work in teams and understand

managers from other disciplines including finance, human resources and marketing. They will be equipped to advance their careers into senior managerial positions.

This is a 48 credit point program. The core program comprises five 6 credit point subjects. The remaining 18 credit points can be selected from the elective subjects listed below.

### Course Program

Subjects	Credit Points	
<b>Core Subjects</b>		
ENGG950	Innovation and Design	6
ENGG951	Engineering Project Management	6
ENGG952	Engineering Computing	6
ENGG954	Strategic Management for Engineers and Technologists	6
ENGG956	Financial Management for Engineered Assets	6
ENGG960	Maintenance Requirements Analysis	6
<b>Elective Subjects</b>		
BUSS907*	Electronic Commerce	6
BUSS927*	Human Computer Interaction	6
BUSS952*	Strategic Information Systems Management	6
ENGG953	Modelling of Engineering Management Systems	6
ENGG961	Systems Reliability Engineering	6
MARK922*	Marketing Management	6
MGMT911*	Organisational Behaviour	6
MGMT915*	Management of Change	6
MGMT940*	Innovation and Entrepreneurship	6
MGMT963*	Management of Occupational Health and Safety	6
MGMT978*	Cross Cultural Management	6
TBS903	Managing People in Organisations	6
TBS904	Marketing Management	6
TBS908	Supply Chain Management	6
TBS950	Quality Management	6

\* *Subjects may require prior knowledge. Students should not enrol in these subjects without consultation and approval of the lecturer(s) concerned.*

### Master of Engineering Asset Management

Testamur Title of Degree:	Master of Engineering Asset Management
Abbreviation:	MEngAssetMgmt
Home Faculty:	Faculty of Engineering
Engineering Discipline:	Mechanical Engineering
Duration:	2 year part-time
Total Credit Points:	48 credit points
Entry Requirements:	A Bachelor of Engineering degree from a recognised tertiary institution
Delivery Mode:	Module
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	TBA
CRICOS Code:	TBA

### Overview

The objective of the program is to ensure continuous improvement in the strategic and tactical response of organisations and their managers, to the management of infrastructure assets. The program provides the knowledge to organise and manage engineered asset costs effectively. From a strategic framework, students progressively address problems in designing and managing assets. This is achieved through a balanced program of subjects in asset management science and engineering, business administration and management and industrial engineering, with emphasis on practical applications. Students learn concepts and techniques by evaluating potential solutions to challenges faced by organisations.

This is a 48 credit point program. The core program comprises six 6 credit point subjects. The remaining 12 credit points can be either two 6 credit point subjects or one 12 credit point dissertation.

### Course Program

Subjects	Credit Points
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**Core Subjects**

ENGG953	Modelling of Engineering Management Systems	6
ENGG956	Financial Management for Engineered Assets	6
ENGG957	Project Implementation and Outsourcing	6
ENGG958	Life-Cycle and Risk Management	6
ENGG960	Maintenance Requirements Analysis	6
ENGG961	Systems Engineering	6

**Elective Subjects:**

ENGG959	Asset Management System Design	6
TBS903	Managing People in Organisations	6

**Or**

ENGG940	Dissertation	12
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**Master of Medical Radiation Physics**

Testamur Title of Degree:	Master of Medical Radiation Physics
Abbreviation:	MMRP
Home Faculty:	Faculty of Engineering
Engineering School:	Engineering Physics
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	Completion of BSc or equivalent with Physics as a major study
Delivery Mode:	Coursework
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	
CRICOS Code:	035592D

**Overview**

Candidates who have completed a Bachelors degree which did not include a relevant major study, will be required to complete additional subjects in Physics as outlined in the Masters Degree regulations. Students who have completed the Bachelor of Medical Radiation Physics from the University of Wollongong, or equivalent specialist course, would be advised to enrol in a Medical Radiation Physics research program. The course consists of a research project and four subjects.

**Course Program**

Subjects	Credit Points	
<b>Core Subjects</b>		
PHYS951	Medical Physics Research Project	18
PHYS952	Radiation and Radiotherapy Physics	8
PHYS953	Medical Imaging and Nuclear Medicine	8
PHYS954	Radiobiology and Radiation Protection	8
GHMB927	An Introduction to Human Anatomy and Physiology	6

**Graduate Diploma in Engineering**

Testamur Title of Degree:	Graduate Diploma in Engineering
Abbreviation:	GradDipEng
Home Faculty:	Faculty of Engineering
Engineering Disciplines:	Civil, Environmental, Materials, Mechanical, Mining
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	A Bachelor of Engineering degree from a recognised tertiary institution
Delivery Mode:	Coursework
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	649
CRICOS Code:	009237F

**Overview**

The Graduate Diploma in Engineering is intended to provide specialised studies in engineering. It may provide entry to the Masters – Research program for students who do not have the necessary entry qualifications, particularly if studying this discipline for the first time.

Students enrol in one of the following 48 credit point subjects according to their discipline area:

Civil Engineering	CIVL899 Advanced Topics in Engineering
Environmental Engineering	ENVE899 Advanced Topics in Engineering
Materials Engineering	MATL899 Advanced Topics in Engineering
Mechanical Engineering	MECH899 Advanced Topics in Engineering
Mining Engineering	MINE899 Advanced Topics in Engineering

## Graduate Diploma in Materials Welding and Joining

Testamur Title of Degree:	Graduate Diploma in Materials Welding and Joining
Abbreviation:	GradDipMWJ
Home Faculty:	Faculty of Engineering
Engineering Discipline:	Materials and Mechanical Engineering
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	A Bachelor of Engineering degree from a recognised tertiary institution or approved equivalent qualification, prior learning and experience
Delivery Mode:	Flexible Delivery
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	CR666
CRICOS Code:	N/A

### Overview

There are 16 modules. Refer to Master of Engineering Practice in Materials Welding and Joining. This course is offered on a flexible delivery basis and is the same as the MEngPrac with the exception of the dissertation which is not required.

## Graduate Diploma Medical Radiation Physics

Testamur Title of Degree:	Graduate Diploma Medical Radiation Physics
Abbreviation:	GDipMRP
Home Faculty:	Faculty of Engineering
Engineering School:	Engineering Physics
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	A pass Bachelor degree of at least three years' duration in a relevant discipline
Delivery Mode:	Coursework
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	TBA
CRICOS Code:	052460G

### Overview

This Graduate Diploma is based on the coursework component of the Master of Medical Radiation Physics; it allows students to complete the formal coursework necessary for ACPSEM accreditation separately from the research component. The Graduate Diploma program has been accepted by the ACPSEM as leading towards accreditation as a professional medical physicist, the Graduate Diploma is not accredited by ACPSEM.

Students must consult the Medical Radiation Physics Discipline Adviser for admission to the course. Forty eight (48) credit points are to be chosen from the following list in consultation with the Physics Discipline Advisor.

### Course Program

Subjects	Credit Points
<b>Core Subjects</b>	
PHYS255 Radiation Physics	6
GMBH927 An Introduction to Human Anatomy and Physiology	6
PHYS952 Radiation and Radiotherapy Physics	8
PHYS953 Medical Imaging and Nuclear Medicine	8
PHYS954 Radiobiology and Radiation Protection	8
Plus 2 electives from the Physics undergraduate program or 900-level Physics subjects	

## Graduate Diploma in Science (Physics)

Testamur Title of Degree:	Graduate Diploma in Science (Physics)
Abbreviation:	GDipSc
Home Faculty:	Faculty of Engineering
Engineering School:	Engineering Physics
Duration:	1 yr full-time or part-time equivalent
Total Credit Points:	48 credit points
Entry Requirements:	A pass Bachelor degree of at least three years' duration in a relevant discipline.
Delivery Mode:	Coursework
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	650
CRICOS Code:	002363A

### Overview

This course is designed to provide:

- 1) a Masters qualifying course for students who have inadequate preparation for direct entry into the Masters by Research program;
- 2) an opportunity for Science teachers who have a degree, but have taken Physics to first or second year level only, to improve their understanding and horizons in Physics;
- 3) an opportunity for international students and students without a full major in Physics to update their knowledge of Physics.

Students must consult the Physics Discipline Adviser for admission to the course. Forty eight (48) credit points are to be chosen from the following list in consultation with the Physics Discipline Advisor.

### Course Program

Subjects	Credit Points	
<b>Core Subjects</b>		
PHYS205	Advanced Modern Physics	6
PHYS215	Vibrations, Waves and Optics	6
PHYS233	Introduction to Environmental Physics	6
PHYS235	Mechanics and Thermodynamics	6
PHYS255	Radiation Physics	6
PHYS295	Astronomy - Concepts of the Universe	6
MATH201	Multivariate and Vector Calculus*	6
MATH202	Applied Differential Equations*	6
MATH283	Mathematics 2E for Engineers Part 1	6
PHYS305	Quantum Mechanics*	6
PHYS325	Electromagnetism*	6
PHYS335	Classic Mechanics*	6
PHYS365	Detection of Radiation: Neutrons, Electrons and X-Rays	6
PHYS375	Nuclear Physics	6
PHYS385	Statistical Mechanics*	6
PHYS390	Astrophysics	6
PHYS401	Theoretical Mechanics and Electromagnetism	8
PHYS441	Advanced Astrophysics	4
PHYS444	Quantum Mechanics	8
PHYS446	Solid State Physics	8
PHYS452	Medical Imaging	8
PHYS453	Radiobiology and Radiation Protection	8
PHYS456	Imaging Physics	8
PHYS910	Advanced Project in Physics A	6
PHYS947	Special Topics in Physics A	6
PHYS948	Physics of Imaging	6
PHYS960	Advanced Project in Physics B	6



PHYS990	Applied Physics Project	24
PHYS997	Special Topics in Physics B	6

*Note: Starred subjects are pre- and co-requisites of some of the physics subjects.*

## Graduate Certificate in Engineering

Testamur Title of Degree:	Graduate Certificate in Engineering
Abbreviation:	GCertEng
Home Faculty:	Faculty of Engineering
Duration:	6mths part-time equivalent
Total Credit Points:	24 credit points
Entry Requirements:	A Bachelor of Engineering degree from a recognised tertiary institution.
Delivery Mode:	Coursework
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	695
CRICOS Code:	N/A

### Overview

This program is designed for those wishing to undertake a short program in engineering. Other qualifications, together with relevant professional experience, will be considered.

On completion of the Graduate Certificate, students can apply to transfer to the Master of Engineering Practice.

### Course Program

Subjects	Credit Points
<b>Core Subjects</b>	
ENGG950 Innovation and Design	6
ENGG951 Engineering Project Management	6
ENGG952 Engineering Computing	6
Plus one elective subject from one of the Master of Engineering Practice programs.	

## Graduate Certificate of Engineering Asset Management

Testamur Title of Degree:	Graduate Certificate of Engineering Asset Management
Abbreviation:	GcertAssetMgmt
Home Faculty:	Faculty of Engineering
Duration:	6mths part-time equivalent
Total Credit Points:	24 credit points
Entry Requirements:	A Bachelor of Engineering degree from a recognised tertiary institution
Delivery Mode:	Coursework
Starting Session(s):	Autumn/Spring
Location:	Wollongong
UOW Course Code:	1134
CRICOS Code:	032520M

### Overview

This course is designed for those wishing to undertake a short program in Engineering Asset Management. On completion of the Graduate Certificate, students can apply to transfer to the Master of Engineering Asset Management.

This is a 24 credit point program. The core program comprises three 6 credit point subjects. The remaining 6 credit points can be from the Master of Engineering Asset Management core or elective list.

### Course Program

Subjects	Credit Points
<b>Core Subjects</b>	
ENGG958 Life-Cycle and Risk Management	6
ENGG960 Maintenance Requirements Analysis	6
ENGG961 Systems Reliability Engineering	6

