Overview

The Master of Engineering is comprised of a foundation year and an advanced studies year. The foundation year consists of a set of courses designed to ensure that students acquire a level of expertise in the relevant specialisation. This program gives the opportunity to study technical courses at an advanced level and the opportunity to engage in a research project. An exit path will be available for students completing only the foundation year, after they satisfy a set requirement within the relevant discipline. In this case a Graduate Diploma will be awarded.

Students must specialise in one of the following disciplines

Aerospace Engineering
Aerospace engineering is focused on the development and use of new technologies and materials that are relevant to any high-tech industries including the aerospace industry.

Chemical Engineering
Chemical Engineering combines knowledge of basic chemistry and mathematics with engineering principles and applies them to the systematic design, development and operation of process systems for the extraction, transformation and recovery of materials.

Civil and Environmental Engineering
Civil and Environmental Engineering is concerned with assessing and managing the effects of human activity on the natural and built environments and doing it in a sustainable manner. This ensures that we can provide adequate infrastructure and natural resources for current generations, without compromising the ability of future generations to do the same.

Civil and Structural Engineering
Civil and Structural Engineering involves the planning, design and construction of society’s major infrastructures such as bridges, buildings, structures, roads, water supply, dams, pipelines, sewerage treatment facilities, drainage, pollution control equipment and coastal management facilities.
Master of Engineering (ME)

Electrical Engineering
This program is designed for graduates who wish to undertake advanced studies in electrical power engineering. It provides an opportunity to study specialist topics such as Power Quality and Fault Diagnostics, Power Systems Monitoring and Protection and Distributed Generation Technologies, as well as an opportunity to develop advanced levels of understanding of related topics in mathematics, project management and system engineering.

Electronic Engineering
This program is intended for graduates who wish to undertake advanced studies in selected specialist topics in electronic engineering. It provides an opportunity to study specialist topics such as Telecommunications, Microelectronics, Image Sensors and Processing and Power Electronic Systems as well as an opportunity to develop advanced levels of understanding of related topics in mathematics, project management and system engineering.

Mechanical Engineering
Mechanical engineering is concerned with the management of people and resources, the development and use of new technologies and the design and development of new processes and products. This mostly involves ‘things that move’, such as motor vehicles, aircraft systems, engines, pumps, gas turbines, industrial plants, air conditioning / refrigeration systems, manufacturing processes, building services and even space stations.

Mechatronic Engineering
Mechatronic engineering is a discipline that combines mechanics with electronics and computing. It involves the design, construction and maintenance of intelligent machines, micro-machines, smart structures, intelligent systems, control systems and consumer products such as cameras, washing machines or a fully automated robotic assembly line or they may be involved with defence technology and systems.

Mining Engineering
The program has an emphasis on technical analysis and evaluation of mining systems including mine design and planning, rock mechanics, modelling and simulation, risk and uncertainty, mining geostatistics, mine management and sustainable mining practices.

Students who have been granted less than 24 units of credit are required to maintain a Grade Point Average of 5.0 for core and elective courses listed in the Academic Program Rules, to the value of 24 units. Students who have not achieved this standard will not be permitted to continue study towards the degree.

The Master of Engineering is an AQF Level 9 Masters Extension qualification with a standard full-time duration of 2 years.

Students who have completed an AQF level 8 Bachelor of Engineering (Honours) degree, or equivalent are eligible for up to 24 units of credit.

Conditions

Condition of Enrolment

1. **Interruption of program**: Students must apply for permission from the Executive Dean or delegate before taking a Leave of Absence. Any extension of the leave without approval will result in the loss of place in the program but an application may be made to be re-admitted to the program subject to the admission procedures in place at the time.

Academic Program Rules for Master of Engineering (ME)

There shall be a Master of Engineering (ME).
Qualification Requirements

Academic Program

To qualify for the Master of Engineering, the student must complete satisfactorily a program of study consisting of the following requirements with a combined total of not less than 48 units, comprising:

1. Courses to the value of 48 units including studies in one of the following disciplines
   - Aerospace
   - Chemical
   - Civil & Environmental
   - Civil & Structural
   - Electrical
   - Electronic
   - Mechanical
   - Mechatronic
   - Mining
2. A Research Project to the value of 12 units
3. A total of 12 weeks practical experience approved by the Faculty and of which a minimum 6 weeks should be under the supervision of a professional engineer. Students who have previously completed an approved 12 week period of practical experience are exempt from this requirement.

Master of Engineering (Aerospace)

To satisfy the requirements for Master of Engineering (Aerospace) students must complete courses to the value of 48 units.

Core

All of the following courses must be completed:
- ELEC ENG 7057 Engineering Communication & Critical Thinking (3 units)
- ELEC ENG 7164 Business Management Systems PG (3 units)
- MATHS 7025 Research Methods and Statistics (3 units)
- PROJMGNT 5021 Project Management Fundamentals (3 units)

Foundation

All of the following courses must be completed:
- MECH ENG 7066 Aeronautical Engineering (3 units)
- MECH ENG 7067 Advanced Mechanics of Materials (3 units)
- MECH ENG 7068 Applied Aerodynamics (3 units)
- MECH ENG 7073 Space Vehicle Design (3 units)

Electives

Courses to the value of 12 units from the following:
- CHEM ENG 7047 Composite & Multiphase Polymers (3 units)
- MECH ENG 7020 Materials Selection & Failure Analysis (3 units)
- MECH ENG 7021 Combustion Technology & Emissions Control (3 units)
- MECH ENG 7023 Fracture Mechanics (3 units)
- MECH ENG 7026 Advanced Topics in Fluid Mechanics (3 units)
- MECH ENG 7027 Engineering Acoustics (3 units)
- MECH ENG 7028 Advanced PID Control (3 units)
- MECH ENG 7030 Advanced Vibrations (3 units)
- MECH ENG 7034 Advanced Digital Control (3 units)
- MECH ENG 7043 Stresses in Plates & Shells (3 units)
- MECH ENG 7045 CFD for Engineering Applications (3 units)
Master of Engineering (ME)

MECH ENG 7053 Aerospace Propulsion (3 units)
MECH ENG 7059 Finite Element Analysis of Structures (3 units)
MECH ENG 7061 Corrosion: Principles & Prevention (3 units)
MECH ENG 7062 Aircraft Design (3 units)
MECH ENG 7063 Advanced Topics in Aerospace Engineering (3 units)

Research Project

All of the following courses must be completed:
MECH ENG 7041A Masters Project Part 1 (0 units)
MECH ENG 7041B Masters Project Part 2 (12 units)

Master of Engineering (Chemical)

To satisfy the requirements for Master of Engineering (Chemical) students must complete courses to the value of 48 units.

Core

All of the following courses must be completed:
ELEC ENG 7057 Engineering Communication & Critical Thinking (3 units)
ELEC ENG 7164 Business Management Systems PG (3 units)
MATHS 7025 Research Methods and Statistics (3 units)
PROJMGNT 5021 Project Management Fundamentals (3 units)

Foundation

Courses to the value of 12 units from the following:
CHEM ENG 7050 Multi-Phase Fluid and Particle Mechanics (3 units)
CHEM ENG 7051 Kinetic & Reactor Design (3 units)
CHEM ENG 7052 Separation Processes (3 units)
CHEM ENG 7054 Simulation and Concept Design (3 units)

Electives

Courses to the value of 12 units from the following:
CHEM ENG 7027 Transport Processes in the Environment (3 units)
CHEM ENG 7035 Water and Waste Water Treatment PG (3 units)
CHEM ENG 7038 Process Plant Safety and Risk Assessment (3 units)
CHEM ENG 7039 Pinch Analysis & Process Synthesis (3 units)
CHEM ENG 7048 Biofuels, Biomass and Wastes (3 units)
CHEM ENG 7055 Material Science & Engineering (3 units)
CHEM ENG 7056 Process Control and Instrumentation (3 units)
CHEM ENG 7058 Hydrometallurgy and Electrometallurgy (3 units)
CHEM ENG 7059 Pyrometallurgy (3 units)
MECH ENG 7021 Combustion Technology & Emissions Control (3 units)

Research Project

All of the following courses must be completed:
CHEM ENG 7046A Masters Project Part 1 (0 units)
CHEM ENG 7046B Masters Project Part 2 (12 units)

Master of Engineering (Civil and Environmental)

To satisfy the requirements for Master of Engineering (Civil and Environmental) students must
complete courses to the value of 48 units.

Core

All of the following courses must be completed:
ELEC ENG 7057 Engineering Communication & Critical Thinking (3 units)
ELEC ENG 7164 Business Management Systems PG (3 units)
MATHS 7025 Research Methods and Statistics (3 units)
PROJMGNT 5021 Project Management Fundamentals (3 units)

Foundation

All of the following courses must be completed:
C&ENVENG 7029 Environmental Modelling & Management (3 units)
C&ENVENG 7077 Engineering Hydrology (3 units)
C&ENVENG 7079 Water Engineering & Design (3 units)
C&ENVENG 7086 Engineering Management (3 units)

Electives

Courses to the value of 12 units from the following:
C&ENVENG 7112 Advanced Civil Geotechnical Engineering (3 units)
C&ENVENG 7037 Water Distribution Systems & Design (3 units)
C&ENVENG 7043 Introduction to Geostatistics (3 units)
C&ENVENG 7047 Analysis of Rivers & Sediment Transport (3 units)
C&ENVENG 7056 Linear Geostatistics (3 units)
C&ENVENG 7108 Environmental Systems Dynamics (3 units)
C&ENVENG 7109 Designing Water Resource Systems for Urban Environments (3 units)
C&ENVENG 7110 Soil & Groundwater Remediation (3 units)
C&ENVENG 7114 Advanced Hydrological Modelling & Water Resource Management (3 units)
C&ENVENG 7115 Advanced Topics in Flood Hydrology (3 units)
LAW 7181 Introduction to Environmental Law PG (3 units)

Research Project

All of the following courses must be completed:
C&ENVENG 7050A Masters Civil Environmental Engineering Project Pt 1 (0 units)
C&ENVENG 7050B Masters Civil Environmental Engineering Project Pt 2 (12 units)

Master of Engineering (Civil and Structural)

To satisfy the requirements for Master of Engineering (Civil and Structural) students must complete courses to the value of 48 units.

Core

All of the following courses must be completed:
ELEC ENG 7057 Engineering Communication & Critical Thinking (3 units)
ELEC ENG 7164 Business Management Systems PG (3 units)
MATHS 7025 Research Methods and Statistics (3 units)
PROJMGNT 5021 Project Management Fundamentals (3 units)

Foundation

All of the following courses must be completed:
C&ENVENG 7005 Reinforced Concrete Design (3 units)
C&ENVENG 7007 Structural Steel Design (3 units)
C&ENVENG 7020 Computer Analysis of Structures and Structural Dynamics (3 units)
C&ENVENG 7069 Geotechnical Engineering (3 units)
Master of Engineering (ME)

Electives

Courses to the value of 12 units from the following:
- C&ENVENG 7033 Seismic Design of Masonry Buildings (3 units)
- C&ENVENG 7037 Water Distribution Systems & Design (3 units)
- C&ENVENG 7042 Advanced Reinforced Concrete (3 units)
- C&ENVENG 7043 Introduction to Geostatistics (3 units)
- C&ENVENG 7047 Analysis of Rivers & Sediment Transport (3 units)
- C&ENVENG 7056 Linear Geostatistics (3 units)
- C&ENVENG 7108 Environmental Systems Dynamics (3 units)
- C&ENVENG 7109 Designing Water Resource Systems for Urban Environments (3 units)
- C&ENVENG 7110 Soil & Groundwater Remediation (3 units)
- C&ENVENG 7111 Structural Dynamics & Applications (3 units)
- C&ENVENG 7112 Advanced Civil Geotechnical Engineering (3 units)
- C&ENVENG 7114 Advanced Hydrological Modelling & Water Resource Management (3 units)
- C&ENVENG 7115 Advanced Topics in Flood Hydrology (3 units)
- MECH ENG 7023 Fracture Mechanics (3 units)
- MECH ENG 7043 Stresses in Plates & Shells (3 units)
- MECH ENG 7059 Finite Element Analysis of Structures (3 units)
- MECH ENG 7061 Corrosion: Principles & Prevention (3 units)

Research Project

All of the following courses must be completed:

- C&ENVENG 7049A Masters Civil Structural Engineering Project Pt 1 (0 units)
- C&ENVENG 7049B Masters Civil Structural Engineering Project Pt 2 (12 units)

Master of Engineering (Electrical)

To satisfy the requirements for Master of Engineering (Electrical) students must complete courses to the value of 48 units.

Core

All of the following courses must be completed:
- ELEC ENG 7057 Engineering Communication & Critical Thinking (3 units)
- ELEC ENG 7164 Business Management Systems PG (3 units)
- MATHS 7025 Research Methods and Statistics (3 units)
- PROJMGNT 5021 Project Management Fundamentals (3 units)

Foundation

All of the following courses must be completed:
- ELEC ENG 7049 Power Electronics Systems (3 units)
- ELEC ENG 7069 Electric Energy Systems (3 units)
- ELEC ENG 7074 Power Systems PG (3 units)
- ELEC ENG 7082 Principles of Control Systems (3 units)

Electives

Courses to the value of 12 units from the following:
- ELEC ENG 7046 Power Quality & Fault Diagnostics (3 units)
- ELEC ENG 7047 Studies in Electrical and Electronic Engineering A (3 units)
- ELEC ENG 7066 Power System Dynamics (3 units)
- ELEC ENG 7068 Power System Monitoring & Protection (3 units)
ELEC ENG 7075  **Distributed Generation Technologies** (3 units)
ELEC ENG 7079  **Principles of Signal Processing** (3 units)
MECH ENG 7034  **Advanced Digital Control** (3 units)
PROJMGNT 7013  **Systems Engineering** (3 units)
PROJMGNT 7057  **Project Controls Method** (3 units)

**Research Project**

All of the following courses must be completed:
ELEC ENG 7078A  **Masters Project (Electrical) Part A** (0 units)
ELEC ENG 7078B  **Masters Project (Electrical) Part B** (12 units)

**Master of Engineering (Electronic)**

To satisfy the requirements for Master of Engineering (Electronic) students must complete courses to the value of 48 units.

**Core**

All of the following courses must be completed:
ELEC ENG 7057  **Engineering Communication & Critical Thinking** (3 units)
ELEC ENG 7164  **Business Management Systems PG** (3 units)
MATHS 7025  **Research Methods and Statistics** (3 units)
PROJMGNT 5021  **Project Management Fundamentals** (3 units)

**Foundation**

All of the following courses must be completed:
ELEC ENG 7033  **Principles of RF Engineering** (3 units)
ELEC ENG 7079  **Principles of Signal Processing** (3 units)
ELEC ENG 7080  **Principles of Communication Systems** (3 units)
ELEC ENG 7082  **Principles of Control Systems** (3 units)

**Electives**

Courses to the value of 12 units from the following:
ELEC ENG 7002  **Kalman Filtering & Applications** (3 units)
ELEC ENG 7015  **Adaptive Signal Processing** (3 units)
ELEC ENG 7049  **Power Electronics Systems** (3 units)
ELEC ENG 7051  **Microelectronic Systems** (3 units)
ELEC ENG 7055  **Antennas & Propagation** (3 units)
ELEC ENG 7059  **Radar Principles & Systems - An Introduction** (3 units)
ELEC ENG 7060  **Image Sensors & Processing** (3 units)
ELEC ENG 7115  **Biomedical Instrumentation PG** (3 units)
ELEC ENG 7081  **Telecommunications Systems** (3 units)

or
ELEC ENG 7083  **Telecommunications Principles & Systems** (6 units)

**Research Project**

All of the following courses must be completed:
ELEC ENG 7077A  **Masters Project (Electronic) Part A** (0 units)
ELEC ENG 7077B  **Masters Project (Electronic) Part B** (12 units)

**Master of Engineering (Mechanical)**

To satisfy the requirements for Master of Engineering (Mechanical) students must complete courses to the value of 48 units.
**Master of Engineering (ME)**

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**Core**

All of the following courses must be completed:
- ELEC ENG 7057 *Engineering Communication & Critical Thinking* (3 units)
- ELEC ENG 7164 *Business Management Systems PG* (3 units)
- MATHS 7025 *Research Methods and Statistics* (3 units)
- PROJMGNT 5021 *Project Management Fundamentals* (3 units)

**Foundation**

All of the following courses must be completed:
- MECH ENG 7047 *Dynamics & Control II* (3 units)
- MECH ENG 7068 *Applied Aerodynamics* (3 units)
- MECH ENG 7070 *Heat Transfer & Thermodynamics* (3 units)
- MECH ENG 7067 *Advanced Mechanics of Materials* (3 units)

**Electives**

Courses to the value of 12 units from the following:
- CHEM ENG 7047 Composite & Multiphase Polymers (3 units)
- MECH ENG 7020 *Materials Selection & Failure Analysis* (3 units)
- MECH ENG 7021 *Combustion Technology & Emissions Control* (3 units)
- MECH ENG 7023 *Fracture Mechanics* (3 units)
- MECH ENG 7025 *Topics in Welded Structures* (3 units)
- MECH ENG 7026 Advanced Topics in Fluid Mechanics (3 units)
- MECH ENG 7027 *Engineering Acoustics* (3 units)
- MECH ENG 7028 *Advanced PID Control* (3 units)
- MECH ENG 7029 *Air conditioning* (3 units)
- MECH ENG 7030 *Advanced Vibrations* (3 units)
- MECH ENG 7034 *Advanced Digital Control* (3 units)
- MECH ENG 7043 *Stresses in Plates & Shells* (3 units)
- MECH ENG 7044 *Biomechanical Engineering* (3 units)
- MECH ENG 7045 *CFD for Engineering Applications* (3 units)
- MECH ENG 7050 *Sustainability & the Environment* (3 units)
- MECH ENG 7059 *Finite Element Analysis of Structures* (3 units)
- MECH ENG 7061 Corrosion: Principles & Prevention (3 units)
- MECH ENG 7075 *Sustainable Thermal Technologies* (3 units)
- MECH ENG 7076 *Renewable Fluid Power Technology* (3 units)

**Research Project**

All of the following courses must be completed:
- MECH ENG 7041A *Masters Project Part 1* (0 units)
- MECH ENG 7041B *Masters Project Part 2* (12 units)

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**Master of Engineering (Mechatronic)**

To satisfy the requirements for Master of Engineering (Mechatronic) students must complete courses to the value of 48 units.

**Core**

All of the following courses must be completed:
- ELEC ENG 7057 *Engineering Communication & Critical Thinking* (3 units)
- ELEC ENG 7164 *Business Management Systems PG* (3 units)
Master of Engineering (ME)

MATHS 7025 Research Methods and Statistics (3 units)
PROJMGNT 5021 Project Management Fundamentals (3 units)

Foundation

All of the following courses must be completed:
MECH ENG 7047 Dynamics & Control II (3 units)
MECH ENG 7070 Heat Transfer & Thermodynamics (3 units)
MECH ENG 7071 Mechatronics II (3 units)
MECH ENG 7072 Micro-Controller Programming (3 units)

Electives

Courses to the value of 12 units from the following:
ELEC ENG 7015 Adaptive Signal Processing (3 units)
ELEC ENG 7033 Principles of RF Engineering (3 units)
ELEC ENG 7049 Power Electronics Systems (3 units)
ELEC ENG 7060 Image Sensors & Processing (3 units)
ELEC ENG 7075 Distributed Generation Technologies (3 units)
MECH ENG 7020 Materials Selection & Failure Analysis (3 units)
MECH ENG 7024 Robotics M (3 units)
MECH ENG 7027 Engineering Acoustics (3 units)
MECH ENG 7028 Advanced PID Control (3 units)
MECH ENG 7029 Air conditioning (3 units)
MECH ENG 7030 Advanced Vibrations (3 units)
MECH ENG 7034 Advanced Digital Control (3 units)

Research Project

All of the following courses must be completed:
MECH ENG 7041A Masters Project Part 1 (0 units)
MECH ENG 7041B Masters Project Part 2 (12 units)

Master of Engineering (Mining)

To satisfy the requirements for Master of Engineering (Mining) students must complete courses to
the value of 48 units.

Core

All of the following courses must be completed:
ELEC ENG 7057 Engineering Communication & Critical Thinking (3 units)
ELEC ENG 7164 Business Management Systems PG (3 units)
MATHS 7025 Research Methods and Statistics (3 units)
PROJMGNT 5021 Project Management Fundamentals (3 units)

Foundation

All of the following courses must be completed:
MINING 7070 Resource Estimation (3 units)
MINING 7071 Mining Systems (3 units)
MINING 7072 Mining Geomechanics (3 units)
MINING 7073 Mine Planning (3 units)

Electives

Courses to the value of 12 units from the following:
C&ENVENG 7043 Introduction to Geostatistics (3 units)
C&ENVENG 7053 Non-Linear Geostatistics (3 units)
C&ENVENG 7056 Linear Geostatistics (3 units)
MINING 7101 Mine Management (3 units)
MINING 7102 Mine Geotechnical Engineering (3 units)
MINING 7106 Hard Rock Mine Design & Feasibility (3 units)
MINING 7107 Surface Mining Systems (3 units)
MINING 7111 Coal Mine Design & Feasibility (3 units)
MINING 7112 Advanced Mine Geotechnical Engineering (3 units)
MINING 7114 Simulation & Animation for Mining Engineers (3 units)
MINING 7068 Mine Ventilation (3 units)
MINING 7069 Rock Breakage (3 units)

Research Project

All of the following courses must be completed:
MINING 7074A Masters Mining Engineering Project Part A (0 units)
MINING 7074B Masters Mining Engineering Project Part B (12 units)

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