School of Engineering

We teach our students to solve problems creatively and take an innovative approach to the development and application of engineering technology.

At a glance

- Opportunity to study abroad at one of many partner universities worldwide.
- Training in emerging areas such as renewable energy, nano-materials, biodegradable structures, solid state lighting, designs of low-carbon products and bio-mimic robots.
- Upon graduation, you will have career opportunities in biotechnology, building and construction, computer programming, food processing, manufacturing, mining, nanotechnology, power generation, robotics, sustainable technologies, telecommunications and transport.

Ranking and recognition

<table>
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<tr>
<th>#22</th>
<th>#27</th>
<th>#29</th>
<th>#51-100</th>
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<tr>
<td>for Chemical Engineering</td>
<td>for Civil and Structural Engineering</td>
<td>for Mechanical Engineering</td>
<td>for Electrical Engineering</td>
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*QS World University Subject Rankings 2015

Tier 5

The School of Engineering is rated Excellent in D-Setara Engineering by the Ministry of Education

Programs offered at the School of Engineering are recognised by the following organisations:

- Tertiary Education Quality and Standards Agency (TEQSA), Australia
- Malaysian Qualifications Agency (MQA)
- Public Services Department of Malaysia (JPA)
- Engineering Accreditation Council Malaysia (EAC)
- Engineers Australia Accreditation Board
As a first year Engineering student at Monash Malaysia, you will have the chance to experience a range of engineering disciplines before deciding on a specialisation.

The common first year of the course also focuses on the role of the engineer in the future. In subsequent years, you can pursue studies in one of the following engineering disciplines: Chemical Engineering, Civil Engineering, Electrical and Computer Systems Engineering, Mechanical Engineering or Mechatronics Engineering.

Course structure

Every student must complete five core units, one general studies unit and two electives in level one. The elective units help to expose students to one or more disciplines in level one.

Areas of study

LEVEL ONE
Core Units
- Computing for engineers
- Mathematics for engineering
- Engineering design A: lighter, faster, stronger
- Engineering design B: cleaner, safer, smarter
- Design C: engineering mobile applications

General Studies Unit
- Leadership and Innovation

Elective Units
Select two units from:
- Chemistry 1 advanced
- Physics for engineering
- Spatial communication in engineering
- Mechanics of fluids (level two)
- Telecommunications
- Digital systems (level two)
- Introduction to Systems Engineering (level two)
Total: 48 points
Application of knowledge in Chemical Engineering is essential for successful scale-up and smooth operation of processes, which leads to the production of value-added items such as petrochemicals, toothpaste, mobile phones, petrol, paper, instant coffee and etc. In addition, Chemical Engineers have great responsibility to produce design of processes that are both inherently and extrinsically safe to prevent major incidents. In level two units, students will gain necessary background in the sciences and engineering fundamentals, covering topics such as mass transfer, heat transfer, thermodynamics etc. When students proceed to higher levels, they will be exposed to core topics in Chemical Engineering such as separation processes, reaction engineering and many others.

Practical work forms an essential part of many units and management studies are introduced at higher levels (level 3 and 4) to provide students with adequate knowledge to manage projects. Students are given the opportunity to integrate a period of industrial experience or time at an overseas university with their studies.

Requirements

Upon entry to Chemical Engineering, students will have to complete 108 points of core Chemical Engineering units and 36 points of electives to complete the course. More information on units offered in levels 2-4 are listed below:

LEVEL TWO

Core Units
All students must complete the following six core units:
- Mechanics of fluids
- Material and energy balances
- Heat and mass transfer
- Thermodynamics I
- Chemistry I advanced
- Advanced engineering mathematics

Elective Units
Recommended elective units:
Select any two of the units below for which you meet prerequisites. Please refer to the course map for unit recommendations.
- Bioprocesses technology
- Nanotechnology and materials 1
- Introduction to process simulation
- Biochemistry for engineers

Total: 48 points

LEVEL THREE

Core Units
All students must complete the following six core units:
- Chemistry and chemical thermodynamics
- Process control
- Reaction engineering
- Separation processes
- Process design
- Transport phenomena and numerical methods

Elective Units
Recommended elective units:
Select any two of the units below for which you meet prerequisites. Please refer to the course map for unit recommendations.
- Environmental impact assessment and management
- Sustainable processing 1
- Bioprocess technology
- Biochemical engineering
- Nanotechnology and materials 1
- Nanotechnology and materials 2

Total: 48 points

LEVEL FOUR

Core Units
All students must complete the following four core units:
- Engineers in society
- Particle technology
- Design project (12 Points)
- Chemical engineering project (12 Points)

Elective Units
Recommended elective units:
Select any two of the units below for which you meet prerequisites. Please refer to the course map for unit recommendations.
- Sustainable processing 2
- Biochemical engineering
- Nanotechnology and materials 2
- Principles and practices of sustainable development*
- Engineering entrepreneurship*

*Students must obtain a HWA of 70% or above and in their final year to enroll in these units.

Total: 48 points

Recommendation

It is recommended that students wishing to enter the Chemical Engineering (CHE) discipline complete Chemistry I advanced and Mechanics of fluid units at level one.
Bachelor of Civil Engineering (Honours)

Civil engineering encompasses four major fields of activity: structural engineering, water resources engineering, transport engineering and geotechnical engineering. Civil engineers are responsible for the basic needs and facilities (or infrastructure) of modern society. They work for government bodies and for private employers as consulting engineers and engineering contractors specialising in areas such as structural design, water engineering, geotechnics, transportation and construction management.

The intention of level two is to develop ‘sub-professional’ skills, ie the ability to design common place engineering artefacts in the context of suitable theoretical treatment. At the same time, students gain some appreciation for the breadth of civil engineering. Theory is developed in parallel with the applications (problems). Theoretical insights are further developed at levels three and four, as more complex scenarios are considered.

Level three is designed to develop ‘core professional’ skills. It includes topics on structure, water, transportation, geomechanics and management. The water and geomechanics groups share another unit in groundwater field as well.

Level four is seen as a period of specialisation. Each student must take both of the core units (6 points each) and a minimum of three Civil Engineering electives (6 points each). The remaining 12 points may be taken anywhere within the University (including the Civil Engineering department), as long as the units do not substantially duplicate a unit already studied. Some of the electives are multidisciplinary.

LEVEL TWO
- Mechanics of solids
- Design of steel and timber structures
- Geomechanics 1
- Water systems
- Transport and traffic engineering
- Advanced Engineering Mathematics
- Two Electives
Total: 48 points

LEVEL THREE
- Engineering investigation
- Geomechanics 2
- Groundwater and environmental geomechanics

- Engineering Hydrology
- Design of concrete and masonry structures
- Building structures and technology
- Two Electives
Total: 48 points

LEVEL FOUR
Core Units
- Building structures and technology
- Project A
- Road Engineering
- Bridge design and assessment
- Water Treatment
- Project Management for Civil Engineers
- Civil engineering practice 4
- Two Electives
Total: 48 points

Elective Units
Recommended elective units:
- Project B
- Advanced structural analysis
- Advanced structural design
- Ground hazards and environmental geotechnics
- Foundation engineering
- Integrated urban water management
- Water resources management
- Transport planning
- Transport systems
- One 6 points of free elective*

*Free electives may be taken from within the school or from a discipline offered by another school. The free elective may also be taken from units offered as part of the Monash Passport program. All free electives must be approved by the Discipline Head.

Total: 48 points

Note: The Civil Engineering program is provisionally accredited by Engineers Australia and EAC. Full accreditation can only be obtained when the first cohort of students is ready to graduate.

Note: The School has the right to restructure its units and change the offering of them as and when necessary.
Bachelor of Electrical and Computer Systems Engineering (Honours)

The first three levels of the course provide a broad foundation in Electrical and Computer Systems Engineering and in sciences such as physics, chemistry and mathematics. At levels three and four, students complete core units and a management unit and are able to choose from a large number of electives which build upon material studied at earlier levels. Electives comprise approximately 37 per cent of levels three and four.

The design and thesis projects at level three and four build self-reliance and planning capabilities in both individual and team-based environments. Projects are often related closely to the department’s exceptionally strong research and collaborative industry programs within its research centres.

LEVEL TWO
- Signals processing
- Telecommunications
- Analogue electronics
- Computer organisation and programming
- Digital systems
- Advanced engineering mathematics
- 12 points of electives from the Electrical and Computer Systems Engineering (ECSE) elective list

Total: 48 points

LEVEL THREE
- Wireless and guided EM
- Control Systems
- Electrical energy systems
- Electronic systems and control
- Computer systems
- Engineering design
- Optimization estimation and numerical methods
- 6 points of electives from the Electrical and Computer Systems Engineering (ECSE) elective list

Total: 48 points

LEVEL FOUR
Core Units
- Project A
- Project B
- Professional practice
- 30 points of electives from the ECSE elective list below

Total: 48 points

Elective Units
The list of elective choices below will be taught in any year, and many will be offered only in alternate years. One of the elective units may, with the written permission of the Discipline Head, be a unit chosen from elsewhere in the University, provided the unit does not substantially duplicate material already studied.

- Communications Theory
- Network performance
- Optical communications
- Advanced control
- Electrical energy – generation and supply
- Organic electronics and microdevices
- Solid state lighting / Energy efficient lighting
- Smart grid

Recommendation
It is recommended that students wishing to enter the Electrical and Computer Systems Engineering (ECSE) discipline complete Telecommunications or Digital systems units.
Bachelor of Mechanical Engineering (Honours)

When specialisation in the field of mechanical engineering begins at level two of the program, it focuses on engineering practice and the engineering sciences. At level three, engineering science and practice studies are extended to a professional level and students are encouraged to learn independently by utilising learning resources available to them.

At level four, students undertake an independent full-year project in an area of personal interest. The results of this project are presented and examined by thesis. In addition, students complete one professional practice and one design core unit plus three engineering electives offering scope for specialisation. A computational analysis unit completes the final level.

LEVEL TWO
- Advanced engineering mathematics with statistics
- Dynamics I
- Engineering design I
- Mechanics of materials
- Mechanics of fluids
- Thermodynamics

Elective Units
- Electromechanics

Select one inter-faculty (Business) elective from the following:
- Malaysian Business Law
- Introductory macroeconomics
- Organisational behaviours
- Introduction to management
- Marketing theory and practice

Total: 48 points

LEVEL THREE
- Fluid mechanics II
- Engineering design II
- Dynamics II
- Thermodynamics and heat transfer
- Solid mechanics
- Systems and control

Elective Units
- Material selection for engineering design
- Experimental project

Total: 48 points

LEVEL FOUR
Core Units
- Project I
- Project II
- Professional practice
- Engineering design III
- Engineering Computational Analysis

Elective Units
Select three units from:
- Non-destructive testing and inspection
- Sustainable engineering and design with nanomaterials
- Refrigeration and air conditioning
- Control systems
- Robotics
- Industrial noise and control
- Momentum, energy & mass transport in engineering systems

Recommendation
It is recommended that students wishing to enter the Mechanical Engineering (MEC) discipline complete Mechanics of fluids units at level one.

Note: Approval must be sought from the Discipline Head in Mechanical Engineering to take any unit not listed above.
At level two, units provide fundamental knowledge across the wide range of disciplines that form the basis of Mechatronics Engineering. Thermodynamics, fluid mechanics, electronics, mechanics, programming and digital electronics are some of the topics covered at level two. At level three, further knowledge is built on these fundamentals of Mechatronics Engineering to a professional level. These specialised areas include sensors, control, manufacturing and electrical energy systems.

At level four, students undertake units that draw together a wide range of fundamental knowledge in a mechatronics context such as robotics. This level allows for specialisation in wider areas of mechatronics through the selection of three elective units. Students have the opportunity to study a unit from another faculty as one of their electives and to undertake a substantial independent investigation in a chosen area. There is a strong emphasis on project work throughout the Mechatronics Engineering course. As with project units at the second, third and fourth level, many other units contain a strong project/design element.

LEVEL TWO
• Advanced engineering mathematics
• Engineering design I
• Mechanics
• Computer organisation and programming
• Analogue electronics
• Thermo-fluids and power systems
• Two elective units
Total: 48 points

LEVEL THREE
• Mechatronics project II
• Dynamical systems
• Sensors and artificial perception
• Modelling and control
• Computer Systems
• Mechatronics and manufacturing
• Electrical energy systems
• One elective units
Total: 48 points

LEVEL FOUR
• Mechatronics final year project I
• Mechatronics final year project II
• Robotics
• Professional practice
• Four elective units
Total: 48 points

LIST OF ELECTIVES
Select seven units from:
• Electrical energy – generation and supply
• Organic electronics and micro devices
• Industrial noise control
• Computation intelligence and AI
• Control systems
• Advanced control
• Network performance
• Instrumentation and measurement technologies

Students may also select one inter-faculty (non-Engineering) unit from the following list:
• Introductory to management
• Organisational behaviour
• Malaysian Business Law
• Marketing theory and practice
• Introductory macroeconomics

Recommendation
It is recommended that students wishing to enter the Mechatronics Engineering (TRC) discipline complete Introduction to Systems Engineering and Digital systems units at level one.

Career opportunities for all Engineering graduates
Graduates can work in fields such as:
• Biotechnology
• Building and construction
• Computer programming
• Food processing
• Industrial electronics
• Manufacturing
• Mining
• Nanotechnology
• Power generation
• Robotics
• Sustainable technologies
Professional attachment

Engineering students at Monash University Malaysia must undergo their industrial training in an industry-based environment after their third year of studies as required by EAC, Board of Engineers Malaysia. The duration of the training is 12 weeks and students must submit a written report detailing the work experience. Companies like British Telecommunications plc, Carrier (M) Sdn Bhd, ExxonMobil Exploration and Production Malaysia Inc., F&B Coca-Cola (Malaysia) Sdn Bhd, Freescale Semiconductor Malaysia Sdn Bhd, Goodyear Malaysia Berhad, Hicom Automotive Manufacturer (M) Sdn Bhd, Malaysia Airlines, IBM (M) Sdn Bhd and Shell Refining Company (Federation of Malaya) Berhad have all provided internship opportunities for our Engineering students. A list of internship providers is available on the noticeboard for students’ reference. A recommendation letter from the School of Engineering is also provided upon request by the student.

In preparation of the industrial training, students are strongly encouraged to:

- Download a copy of Industrial Training Guidelines from Moodle
- Attend the Industrial Training Briefing, specially conducted for engineering students in April/May each year.
- Consult the respective Industrial Training Advisors in their individual discipline should there be any queries.
Master of Advanced Engineering

The Master of Advanced Engineering (Energy and Sustainability) is designed for working engineers and engineering graduates with an ambition to lead. Addressing the pertinent demands in sustainable energy development, the course guides students to greater applicable knowledge in this area of specialisation and to succeed in complex problem solving methods.

This program is ideal for those who aspire for career advancement in the competitive global environment.

Core units
- Advanced Engineering Data Analysis
- Engineering Entrepreneurship

Major units
- Energy Conservation and Management
- Sustainable Energy Technologies
- Energy Efficient Lighting
- Principles and Practices for Sustainable Development

Elective units
- Environmental and Air Pollution Control
- Smart Grids
- Minor project

Master of Engineering Science (Research)

Objectives
This degree is intended to provide students with basic training in the methodology of research and allow them to gain an in-depth insight into an important topic of current engineering interest. In this course, students undertake a research project in one of the areas of specialisation. The objective of the course is for students to demonstrate a thorough understanding of relevant research techniques in their field through a review of the relevant literature and apply relevant research techniques to their chosen field of study. For successful completion, the candidates are required to submit a thesis on their work, which the examiners should find to have demonstrated the candidate’s mastery in the research area.

Course information
- [http://www.monash.edu.my/study/postgraduate-and-research/engineering/master-engineering-science-research/](http://www.monash.edu.my/study/postgraduate-and-research/engineering/master-engineering-science-research/)
Doctor of Philosophy

Research students are admitted to probationary candidature for Master of Engineering Science (Research) in the first year. They may choose to complete their study in Master of Engineering Science (Research) or transfer their candidature to PhD degree at the end of the probationary period. Research students with outstanding academic track record and research experience can be admitted directly into a PhD program.

Objectives

This degree is intended to provide students with advance-level research training. Students will demonstrate a thorough understanding of relevant research techniques in their field through a review of the relevant literature. They will also demonstrate their ability to:

- Identify and define good research questions
- Apply an appropriate research method to address the research questions
- Demonstrate mastery of their chosen research methodology and knowledge in the relevant discipline
- Communicate the research findings in a format appropriate to their academic discipline
- Write and produce their research into a high quality document containing all the required components of a PhD thesis
- Make an original contribution to their field of study

Every research student will be academically supported by at least two supervisors. Successful completion of the program will signify that you have completed a course of postgraduate training in research under proper academic supervision, have demonstrated the capacity to carry out independent research and made a significant contribution to knowledge.

Course information

- http://www.monash.edu.my/study/postgraduate-and-research/engineering/phd/
The School of Engineering together with the School of IT, Monash University Malaysia, has designed a challenging and engaging program for high performing undergraduate Engineering and IT students to ensure they have leadership and employability skills to accompany their world-class degree studies. Students, who are selected for this program, will be groomed to be engineering leaders of the future.

This one-year program will stimulate and inspire these future leaders, taking them out of their comfort zone while providing a supportive learning environment. They will develop skills which will serve them well beyond the transition from student to engineering professional.

The program includes a retreat, a series of expert-led workshops, field trips to companies, industry leadership engagement evenings and culminates in a participant-organised leadership summit.

Significant monetary and in-kind contributions from industry make this program possible.

### Engineering and IT Leadership Program (EILP)

### External Design Competition

The School supports students to participate in external design competitions. For example, in 2014, the School supported students to participate in Shell Eco Marathon Asia, Institution of Engineers Malaysia Chemical Engineering Design, The Freescale Racecar and Warman Student Design and Build competitions.
Enhanced Learning

Mentoring

**Buddy-Buddee**
Buddy-Buddee is a voluntary peer mentoring programme for engineering students. A Buddy is a current engineering student mentor and a Buddee is a new first year student mentee. A Buddy provides support, guidance and advice to Buddees to help them adjust to academic and social life.

**Mentor-mentee**
Mentor-mentee matches a School of Engineering academic with a student requiring expert assistance in coping with the rigours of engineering study. Usually students will be guided by the Heads of Discipline to seek help through this mentor-mentee program. Students can also seek help on their own through specified mentor-mentee coordinators.

**Peer Assisted Study Sessions (PASS)**
Peer Assisted Study Sessions (PASS) is a voluntary assistance program to help students to succeed in difficult units. PASS sessions are different from tutorials – they are more student-oriented.
Identified postgraduate and/or undergraduate students are appointed as PASS leaders to help in these sessions. Academics and/or postgraduate students act as PASS coordinators to oversee the implementation of this program for each unit.

**Undergraduate Research Opportunities Program (UROP)**
UROP provides undergraduate engineering students an early opportunity to experience a genuine research environment, working either with a supervisor and/or a research group. Students will acquire knowledge and skills to enable them to undertake independent research skills and prepare them for Final Year Project and/or Higher Degree by Research studies.

Industry Engagement

The School of Engineering engages with industry in various ways. Each discipline in the School has its own industry advisory panel to provide high level input on engineering education in Malaysia, and particularly emerging and anticipated industry needs.

The School’s Engineering and IT Leadership Program (EILP) receives considerable support from industries in terms of sponsorship, facilitators and mentors. Many final year and research projects are conducted in collaboration with our industry partners.

In addition to that, industry leaders contribute through career talks, guest lectures and industry-based seminars. Students undertaking engineering programs are required to undergo a compulsory industrial training. Many collaborations have also been established in this context.
Engineers Without Borders - Monash University Malaysia Student Chapter (EWB-MUM)

Engineers Without Borders is a non-profit organisation that aims to harness the knowledge and skills of engineering students and professionals to help underprivileged communities through the development of simple, sustainable solutions. EWB-MUM is a student chapter supported by Engineers Without Borders Malaysia and the Monash University Malaysia School of Engineering.

This student chapter serves as a platform for students to apply their theoretical knowledge in engineering to help the wider community. Students who join the EWB-MUM activities develop skills such as leadership, teamwork, time management and project management. Students will also have the opportunity to engage professionals in the industry.

Some of EWB-MUM’s activities included:

- Hosting a life skills workshop for refugee students from the Fugee School, including demonstrating the use of simple water filtration system and simple flashlight fabrication
- Fundraising and install a micro-hydrogenerator for a school in Budok Aru, Sarawak, in collaboration with LightUp Borneo
- Organising a bridge-building competition using newspapers, for refugee students from IDEAS Academy
- Constructing a wood workshop for a shelter home under the Project PLC (Positive Living Community)
- Repainting of walls for the Zomi School for Myanmar refugees, in collaboration with the Voice of Refugees
Contact us
Business hours: Mondays to Fridays 8.30am – 6pm
Counselling hours for course enquiries: Mondays to Fridays 8.30am – 6pm and Saturdays 9am – 12.30pm
Closed on Sundays and Public Holidays

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