

E3001 Bachelor of Engineering (Honours)

Engineering minors in Malaysia

Update version: 29 December 2025

Considering an engineering minor alongside your discipline study offers a valuable opportunity to broaden your specialisation and enhance your problem-solving skills. By exploring complementary engineering disciplines, you can tailor your education to match your interests and career aspirations. Engineering minors enrich your knowledge base and enhance your appeal to employers in a dynamic job market.

Below are complementary minors available within each engineering specialisation. **To embark on your chosen engineering minor, please enrol via WES today.**

Before commencing a minor, it is essential for you to review the prerequisite requirements for the units within the minor and proactively plan ahead to fulfil the requirements.

Important note. The BE(Hons) course requires you to complete 36 credit points of electives across Years 2, 3 and 4. Of these, 24 points may be used towards an engineering minor. If you do not complete all four units required for the minor (ie. if you discontinue the minor), any units completed towards the minor will be treated as electives. You must then ensure that you meet the standard course elective requirements. This means: 12 credit points of level 1, 2 or 3 engineering elective units (note that level 1 units across your entire course, counting core and elective units, must not exceed 60 credit points in total) *and* 24 credit points that **must** be completed as level 3 or 4 engineering units. Please plan your enrolment carefully to ensure you continue to meet the course requirements and remain on track to complete your course within the expected timeframe. [Refer to your course map.](#)

Engineering minors		Chemical engineering	Civil engineering	Electrical & computer systems engineering	Mechanical engineering	Robotics & mechatronics engineering
	Artificial intelligence in engineering See UPDATES below	Available		Available	Available	Available Pre-2025: Automation stream only
	Decarbonisation and net zero	Available			Available	Available
	Electric vehicle technology See UPDATES below	Available	Available	Available	Available	Available
	Future mobility systems See below		Available			
	Intelligent manufacturing See UPDATES below	Available		Available	Available	Available
	Internet of Things (IoT)			Available	Available	Available
	Semiconductor See UPDATES below	Available		Available	Available	Available *
	Sensory systems in Industry 4.0	Available			Available	Available Pre-2025: Automation stream only
	Sustainable energy transition	Available			Available	

NOTE:

Minors are not available to students in the biomedical engineering and software engineering specialisations.

UPDATES FOR MINORS		Expect a short delay before the handbook displays the updates below.
Artificial intelligence in engineering	From 2026 : This minor will open to students specialising in chemical engineering. You complete ECE2191, TRC2001, MEC3822 and CIV4100 Specialising in electrical and computer systems engineering – MEC3822 is added to the list of available units. Specialising in robotics and mechatronics engineering – You complete four units selected from (ECE2191, TRC2001, MEC3822, ECE4078, CIV4100, ECE4810). ECE4076 and ECE4179 are removed from the minor from 2026. If you've been advised to replace a core unit in the specialisation with either of these, they'll count toward your specialisation. You'll need to take another unit from the minor's list to complete the minor.	
Electric vehicle technology	From 2026 : Specialising in chemical, civil or mechanical engineering – You complete ECE2131, MEC3821 and two units selected from (ECE3051, ECE3161, MEC3831, CIV4100, ECE4886). Specialising in electrical and computer systems engineering – You complete MEC3821 and three units selected from (MEC3831, TRC3500, CIV4100, ECE4078, ECE4886). Specialising in robotics and mechatronics engineering – You complete MEC3821 and three units selected from (ECE3051, ECE3161, ECE3416, MEC3831, CIV4100, ECE4078, ECE4886).	
Intelligent manufacturing	From 2026 : This minor will open to students specialising in chemical engineering. You complete MEC2811, TRC2001, MEC3800 and MEC3822	
Semiconductor	From 2026 : This minor will open to students specialising in chemical engineering. You complete ECE2131, MEC3800, ECE4808 and MEC4801 Specialising in robotics and mechatronics engineering – ECE2072 is removed from the list of available units in the minor. If you've completed the unit, it'll count towards your specialisation.	

Bachelor of Engineering (Honours)

2026 Technical electives in Malaysia

Update version: 6 July 2026

● Offered in 2025 ✕ Not offered in 2025 Offerings are subject to change		
Semester 1	Semester 2	Other

First Year breadth study

¹ **Biomedical engineering:** If you intend to specialise in biomedical engineering, you must complete BIO1011 as a First Year breadth study unit.

² **Software engineering:** If you intend to specialise in software engineering, you must select and complete FIT1045 as a breadth study unit. It provides essential grounding in programming and prepares you for advanced software engineering units.

³ **NOTE: First Year engineering breadth unit that is also a core unit in your specialisation**

From 2025: If you complete a unit from this list that is also a core unit in your chosen specialisation, it will count towards that specialisation. You must still fulfil the First Year engineering breadth study requirement by completing another breadth unit.

BIO1011	Blueprints for life ¹	●		
CHM1051	Chemistry 1 advanced ³	●	●	●
ENG1021	Spatial communication in engineering		●	
ENG1811	Engineering Industry 4.0 Design	●		
ENG1812	Leadership and entrepreneurship		●	● October
ENG1813	Next-Gen uncrewed vehicle			● Summer A
FIT1045	Introduction to programming ²	●	●	● October
FIT1056	Introduction to software engineering		●	
PHS1002	Physics for engineering	●		
CHE2161	Mechanics of fluids ³		●	
CHE2167	Process material selection	●		
CHE2871	Biochemistry for engineers	●		
ECE2072	Digital systems ³		●	
MEC2811	Manufacturing processes	●		
MTE2201	Plastics and the planet: Health, impact and sustainability ³		●	
TRC2001	Introduction to systems engineering		●	

Chemical engineering

Electives must be completed at the unit level required to satisfy your course requirements. You may consider other engineering technical units chosen from the engineering minors, subject to meeting the unit prerequisite or co-requisite rules.

* Industry 4.0 units

CHE2166	Introduction to process simulation		●	
CHE2167	Process material selection	●		
CHE2871	Biochemistry for engineers	●		
CHE2873	Introduction to chemical processes	●		
ECE2071	Computer organisation and programming *	●		
ECE2131	Electrical circuits *	●		
CHE3163	Sustainable processing 1	●		
CHE3171	Bioprocess technology		●	
CHE3172	Nanotechnology and materials 1		●	
CHE3873	Pilot plant project	●	●	
TRC3500	Sensors and artificial perception *	●		
CHE4171	Biochemical engineering		●	
CHE4172	Nanotechnology and materials 2		●	
CHE4173	Sustainable process integration	●		
CHE4803	Carbon capture, storage and utilisation	●		
CHE4806	Low-carbon technology	●		
CHE4807	Carbon footprint and energy management		●	

You may also select an elective from any engineering minor (without needing to complete the minor), provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, ensure you continue to meet the elective requirements across Years 2, 3 and 4 of your course and remain on track for expected completion of your course. [See your course map:](#)

- 12 credit points can be level 1, 2 or 3 engineering units (note that level 1 units across your entire course, counting core and elective units, must not exceed 60 credit points in total), and
- 24 credit points must be completed as level 3 or 4 engineering units. You may also be eligible to enrol in up to two level 5 units in your final year if you meet the WAM requirement by the end of Year 3.

Semester 1	Semester 2	Other
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Civil engineering

Electives must be completed at the unit level required to satisfy your course requirements. You may consider other engineering technical units chosen from the engineering minors, subject to meeting the unit prerequisite or co-requisite rules.

*** NOTE:** You must complete ENG1021 to satisfy Engineering Accreditation Council (EAC) accreditation requirements.

ENG1021	Spatial communication in engineering*		●	
CIV2283	Civil engineering construction	●		
CIV3283	Road engineering (Available elective to students who commenced Civil Engineering before 2020)		●	
CIV4100	Autonomous vehicle systems	●		
CIV4234	Advanced structural analysis	●		
CIV4235	Advanced structural design		●	
CIV4248	Ground hazards engineering	●		
CIV4261	Integrated urban water management	●		
CIV4268	Water security in a changing climate		●	
CIV4283	Transport planning	●		
CIV4284	Sustainable traffic systems		●	
You may also select an elective from any engineering minor (without needing to complete the minor), provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, ensure you continue to meet the elective requirements across Years 2, 3 and 4 of your course and remain on track for expected completion of your course. See your course map: 12 credit points can be level 1, 2 or 3 engineering units (note that level 1 units across your entire course, counting core and elective units, must not exceed 60 credit points in total), and 24 credit points <u>must</u> be completed as level 3 or 4 engineering units. You may also be eligible to enrol in up to two level 5 units in your final year if you meet the WAM requirement by the end of Year 3.				

Electrical and computer systems engineering

Electives must be completed at the unit level required to satisfy your course requirements. You may consider other engineering technical units chosen from the engineering minors, subject to meeting the unit prerequisite or co-requisite rules.

CORE ELECTIVES

The ECSE specialisation requires the completion of sixteen core units AND two core electives chosen from the ECSE technical electives list. **The core electives must be level 4 or 5 ECE-coded.**

¹ **Level 5 units:** You must obtain a weighted average mark (WAM) of 65 or above at the conclusion of level 3 and be in your final year to be eligible to enrol in the level 5 units.

MMA2002	Solid mechanics 1	●		
TRC2001	Introduction to systems engineering		●	
ECE3093	Optimisation and numerical methods for engineers	✕		
MEC3001	Material properties and selection		●	
TRC3500	Sensors and artificial perception	●		
ECE4032	Advanced control	✕		
ECE4043	Optical communications	✕		
ECE4044	Telecommunications protocols	✕		
ECE4045	Network performance		✕	
ECE4053	Power system analysis		●	
ECE4063	Integrated circuit design	●		
ECE4075	Real time embedded systems	✕		
ECE4076	Computer vision	●		
ECE4078	Intelligent robotics		●	
ECE4122	Advanced electromagnetics		✕	
ECE4146	Multimedia technologies		✕	
ECE4179	Neural networks and deep learning	●	●	
ECE4808	Microsystems and semiconductor fabrication		●	
ECE4809	Solid state lighting		●	
ECE4810	Internet of things: Communication, data and security		●	
ECE4813	Arm based system-on-chip design		●	
ECE4886	Smart grids		●	
MEC5885	Energy efficiency and sustainability engineering ¹	●		
MEC5886	Sustainable energy technologies ¹		●	
You may also select an elective from any engineering minor (without needing to complete the minor), provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, ensure you continue to meet the elective requirements across Years 2, 3 and 4 of your course and remain on track for expected completion of your course. See your course map: 12 credit points can be level 1, 2 or 3 engineering units (note that level 1 units across your entire course, counting core and elective units, must not exceed 60 credit points in total), and 24 credit points <u>must</u> be completed as level 3 or 4 engineering units. You may also be eligible to enrol in up to two level 5 units in your final year if you meet the WAM requirement by the end of Year 3.				

Semester 1	Semester 2	Other
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Mechanical engineering

Electives must be completed at the unit level required to satisfy your course requirements. You may consider other engineering technical units chosen from the engineering minors, subject to meeting the unit prerequisite or co-requisite rules.

¹ **Level 5 units:** You must obtain a weighted average mark (WAM) of 65 or above at the conclusion of level 3 and be in your final year to be eligible to enrol in the level 5 units.

ECE2131	Electrical circuits	●		
MEC2811	Manufacturing processes	●		
MEC2812	Machine learning in industrial systems		●	
TRC2001	Introduction to systems engineering		●	
MEC3800	Introduction to reliability engineering		●	
MEC3821	Introduction to electric vehicle technology	●		
MEC3822	Artificial intelligence in manufacturing	●		
MEC3831	Special projects in automotive design and build			● Summer A
MMA3101	Computational fluid dynamics	✕		
MMA3102	Composite mechanics		✕	
MMA3103	Linear algebra - Offering from 2027		✕	
TRC3500	Sensors and artificial perception	●		
CHE4803	Carbon capture, storage and utilisation	●		
CHE4806	Low-carbon technology	●		
CHE4807	Carbon footprint and energy management		●	
ECE4179	Neural networks and deep learning	●	●	
MEC4101	Airborne and waterborne acoustics		✕	
MEC4417	Energy-efficient cooling systems		●	
MEC4801	Non-destructive testing and inspection	●		
MEC4803	Sustainable combustion technologies	●		
TRC4200	Engineering cyber-physical systems	●		
TRC4800	Robotics	●		
MEC5801	Industrial ecology ¹		●	
MEC5885	Energy efficiency and sustainability engineering ¹	●		
MEC5886	Sustainable energy technologies ¹		●	
MEC5891	Design for additive manufacturing ¹	●		
MEC5897	Lean manufacturing ¹		●	
TRC5801	Data driven supply chain optimisation and AI applications ¹	●		
You may also select an elective from any engineering minor (without needing to complete the minor), provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, ensure you continue to meet the elective requirements across Years 2, 3 and 4 of your course and remain on track for expected completion of your course. See your course map: 12 credit points can be level 1, 2 or 3 engineering units (note that level 1 units across your entire course, counting core and elective units, must not exceed 60 credit points in total), and 24 credit points <u>must</u> be completed as level 3 or 4 engineering units. You may also be eligible to enrol in up to two level 5 units in your final year if you meet the WAM requirement by the end of Year 3.				

Robotics and mechatronics engineering

Electives must be completed at the unit level required to satisfy your course requirements. You may consider other engineering technical units chosen from the engineering minors, subject to meeting the unit prerequisite or co-requisite rules.

¹ **Accreditation in Malaysia:** You must complete the unit/s applicable to the year you commenced your course to satisfy the Engineering Accreditation Council Malaysia (EAC) accreditation requirement:

- Commencing before 2025: [(ECE3051 or MEC3416 or MEC3821) and TRC4802]

ECE2111	Signals and systems		●	
ECE2191	Probability and AI for engineers		●	
MMA2002	Solid mechanics 1	●		
TRC2001	Introduction to systems engineering		●	
ECE3051	Electrical energy systems ¹	●		
ECE3141	Information and networks	●		
ECE3161	Analogue electronics		●	
MMA3001	Numerical methods and machine learning		●	
MMA3101	Computational fluid dynamics	✕		
MMA3102	Composite mechanics		✕	
MMA3103	Linear algebra - Offering from 2027		✕	
CHE4806	Low-carbon technology	●		

Semester 1	Semester 2	Other
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- Commencing 2025 onwards: One of (ECE3051 or MEC3821 or TRC4902)

² **Level 5 units:** You must obtain a weighted average mark (WAM) of 65 or above at the conclusion of level 3 and be in your final year to be eligible to enrol in the level 5 units.

CHE4807	Carbon footprint and energy management		●	
ECE4044	Telecommunication protocols	✕		
ECE4053	Power system analysis		●	
ECE4078	Intelligent robotics		●	
ECE4146	Multimedia technologies		✕	
ECE4886	Smart grids		●	
TRC4200	Engineering cyber-physical systems	●		
TRC4902	Mechatronics and manufacturing		●	
You may also select an elective from any engineering minor (without needing to complete the minor), provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, ensure you continue to meet the elective requirements across Years 2, 3 and 4 of your course and remain on track for expected completion of your course. See your course map: 12 credit points can be level 1, 2 or 3 engineering units (note that level 1 units across your entire course, counting core and elective units, must not exceed 60 credit points in total), and 24 credit points <u>must</u> be completed as level 3 or 4 engineering units. You may also be eligible to enrol in up to two level 5 units in your final year if you meet the WAM requirement by the end of Year 3.				

Software engineering

Electives must be completed at the unit level required to satisfy your course requirements.

FIT3003	Business intelligence and data warehousing		●	
FIT3080	Artificial intelligence		●	
FIT3134	Entrepreneurship			● Summer A
FIT3143	Parallel computing		●	
FIT3152	Data analytics	●		
FIT3154	Advanced data analysis		●	
FIT3155	Advanced data structures and algorithms	●	●	
FIT3175	Usability			● Summer B
FIT3179	Data visualisation		●	
FIT3181	Deep learning		●	
FIT3182	Big data management and processing	●		
FIT3183	Malicious AI and dark side security		●	
FIT4005	IT research and innovation methods	●	●	
FIT4009	Advanced topics in intelligent systems		✕	
FIT5145	Foundations of data science	●	●	
FIT5196	Data wrangling		●	
FIT5201	Machine learning	●	●	
FIT5202	Data processing for big data	●	●	
FIT5215	Deep learning		●	
FIT5216	Modelling discrete optimisation problems	●		
FIT5217	Natural language processing	●		
FIT5221	Intelligent image and video analysis	✕		
FIT5233	Digital transformation, strategy and governance	●		