

Bachelor of Engineering (Honours)

2027 Available technical electives in Clayton

Update version: 7 October 2026

● Offered × Not offered Offerings are subject to change	
Semester 1	Semester 2

First Year breadth study

¹ **Biomedical engineering:** If you intend to specialise in biomedical engineering, you must complete [BIO1011](#) as a First Year breadth 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 CHM1011 and CHM1051 are mutual prohibition units; you can only complete either CHM1011 or CHM1051.

⁴ **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	●	
CHE1010 Grand challenges in chemical engineering: Delivering sustainable food, water and energy		●
CHM1011 Chemistry 1 or CHM1051 Chemistry 1 advanced ^{3,4}	●	
ENE1621 Environmental engineering	●	
ENG1021 Spatial communication in engineering		●
ENG1051 Materials for energy and sustainability	●	
FIT1045 Software development 1: Programming foundations ²	●	●
FIT1056 Making with artificial intelligence: Software in the AI era	●	●
PHS1002 Physics for engineering		●
RSE1010 Introduction to resources engineering		×
CHE2161 Mechanics of fluids ⁴		●
ECE2072 Digital systems ⁴		●
MTE2201 Plastics and the planet: Health, impact and sustainability ⁴		●

Aerospace engineering

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

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 level 5 units

MMA3101 Computational fluid dynamics	●	
MMA3102 Mechanics of composite materials		●
MMA3103 Linear algebra - Proposed from 2027	Currently pending approval	
MAE4101 Advanced aerospace dynamics and modelling - Proposed from 2027		Currently pending approval
TRC4800 Robotics	●	
You may also select a unit listed across the engineering minors to complete as an elective, provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, you must ensure that you continue to meet the elective requirements across Years 2, 3 and 4 and remain on track to complete 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.		

Biomedical engineering

If you are completing the biomedical engineering specialisation, your elective must be selected from this prescribed list.

ECE2191 Probability and AI for engineering		●
ECE3093 Optimisation and numerical methods for engineers	●	
ECE3121 Engineering electromagnetics		●
ECE3133 Control systems		●
ECE3141 Information and networks	●	
ECE3161 Analogue electronics		●
PHY3012 Integrative neuroscience		●
PHY3072 Exercise physiology		●
PHY3111 Sensory and cognitive neuroscience	●	

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PHY3171	Cardiovascular physiology and disease	●	
ECE4076	Computer vision	●	
ECE4078	Intelligent robotics		●
ECE4086	Medical imaging technology		×

Chemical engineering

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

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 level 5 units.

CHE2166	Introduction to process simulation		●
CHM2951	Environmental chemistry – Water	●	
ECE2071	Computer organisation and programming	●	
ECE2131	Electrical circuits	●	
MTH2232	Mathematical statistics		●
CHE3133	Food engineering	●	
CHE3163	Sustainable processing	●	
CHE3172	Nanotechnology and materials 1		●
CHM3960	Environmental chemistry	●	
RSE3243	Bioenergy		●
TRC3500	Sensors and artificial perception	●	
CHE4172	Nanotechnology and materials 2		●
CHE4173	Sustainable process integration	●	
ENE4042	Environmental impact and risk assessment	●	
CHE5321	Advanced bioprocess technology ¹	●	
CHE5322	Advanced biochemical engineering ¹		●
CHE5881	Advanced reaction engineering ¹	●	
CHE5882	Biomass and bio-refineries ¹		●
CHE5883	Nanostructured membranes for separation and energy production ¹		●
CHE5884	Process modelling and optimisation ¹	●	
CHE5889	Food engineering and processing ¹		●
ENG5002	Engineering entrepreneurship ¹		×

You may also select a unit listed across the engineering minors to complete as an elective, provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, you must ensure that you continue to meet the elective requirements across Years 2, 3 and 4 and remain on track to complete 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.

Civil engineering

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

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 level 5 units.

ENG1021	Spatial communication in engineering		●
CIV2283	Civil engineering construction	● Semester 1 Extended	
ENE2268	Hydrology and climate change		●
ENE2503	Material properties and recycling		●
RSE2010	Fixed plant engineering and project management		×
RSE3010	Mine geotechnical engineering	●	
RSE3020	Resource estimation	●	
RSE3030	Ventilation for surface and underground spaces	×	
RSE3040	Mining systems		●
RSE3060	Rock breakage		●
RSE3141	Solar energy	●	
RSE3241	Hydropower		●
RSE3242	Geothermal energy	●	
RSE3243	Bioenergy		●
CIV4100	Autonomous vehicle systems	●	
CIV4234	Advanced structural analysis	×	

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CIV4235	Advanced structural design		×
CIV4261	Integrated urban water management	×	
CIV4283	Transport planning		×
CIV4284	Sustainable traffic systems		●
CIV4293	Transport planning for Asian cities		×
ENE4043	Quantifying sustainability in urban systems	●	
ENE4044	AI applications for civil and environmental engineers		●
CIV5148	Ground hazards engineering ¹	●	
CIV5301	Advanced traffic engineering ¹		×
CIV5302	Traffic engineering and management ¹	●	
CIV5304	Intelligent transport systems ¹		×
CIV5314	Planning urban mobility futures ¹		●
CIV5881	Ground water hydraulics ¹	×	
CIV5882	Flood hydraulics and hydrology ¹		×
CIV5883	Surface water hydrology ¹		×
CIV5884	Water sensitive storm water design ¹	●	
CIV5885	Infrastructure dynamics ¹	●	
CIV5887	Infrastructure rehabilitation and monitoring ¹		●
CIV5888	Advanced computational methods ¹		●
CIV5899	Infrastructure information management ¹	●	
ENG5331	Railway engineering ¹		●
You may also select a unit listed across the engineering minors to complete as an elective, provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, you must ensure that you continue to meet the elective requirements across Years 2, 3 and 4 and remain on track to complete 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.			

Water engineering

Electives to take if you are interested in studying water engineering:

RSE3241	Hydropower		●
CIV5884	Water sensitive storm water design ¹	●	

Electrical and computer systems engineering

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

CORE ELECTIVES

Commencing your course before 2025:
The ECSE specialisation requires completion of sixteen core units and two core electives chosen from this ECSE elective list. *The core electives must be level 4 or 5 and ECE-coded.*

Commencing your course in 2025 or after: [Refer to your course map](#) for link to the Core List A and B elective lists.

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 level 5 units.

MMA2002	Solid mechanics ¹	●	
ECE3093	Optimisation and numerical methods for engineers	●	
ECE3142	Digital communication	●	
ECE3192	Fundamentals of deep learning		●
MEC3001	Material properties and selection	●	
MTE3104	Electronic and photonic materials	●	
MTE3202	Magnetic and spintronic materials		●
RSE3141	Solar energy	●	
TRC3500	Sensors and artificial perception	●	
ECE4024	Wireless communications		×
ECE4043	Optical communications		×
ECE4044	Telecommunications protocols	×	
ECE4045	Network performance	×	
ECE4053	Power system analysis		●
ECE4055	Power electronic converters for modern power systems	●	
ECE4058	Electrical energy - high voltage engineering		×
ECE4076	Computer vision	●	
ECE4078	Intelligent robotics		●

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ECE4081	Medical instrumentation		●
ECE4086	Medical imaging technology		×
ECE4087	Medical technology innovation		●
ECE4122	Advanced electromagnetics		●
ECE4146	Multimedia technologies	×	
ECE4886	Smart grids		●
ECE5156	Advanced power electronics ¹		●
ECE5881	Real-time system design ¹	×	
ECE5882	Advanced electronics design ¹	●	
ECE5883	Advanced signal processing ¹	●	
MEC5885	Energy efficiency and sustainability engineering ¹	●	
You may also select a unit listed across the engineering minors to complete as an elective, provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, you must ensure that you continue to meet the elective requirements across Years 2, 3 and 4 and remain on track to complete 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.			

Environmental engineering

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

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 level 5 units.

ENE1621	Environmental engineering	●	
ATS2548	Climate and environmental policy and management		●
BIO2011	Ecology and biodiversity	●	
BIO2040	Conservation biology		●
CIV2242	Geomechanics 1		●
CIV2282	Transport and traffic engineering	●	
ECX2800	Prosperity, poverty and sustainability in a globalised world		●
CHE3161	Chemistry and chemical thermodynamics	●	
CHE3163	Sustainable processing	●	
CHE3165	Separation processes	●	
CHE3166	Process design		●
CIV3247	Geomechanics 2		●
RSE3020	Resource estimation	●	
RSE3030	Ventilation for surface and underground spaces	×	
RSE3040	Mining systems		●
RSE3060	Rock breakage		●
RSE3141	Solar energy	●	
RSE3241	Hydropower		●
RSE3243	Bioenergy		●
CIV4249	Foundation engineering	●	
CIV4261	Integrated urban water management	×	
CIV4283	Transport planning		×
CIV4284	Sustainable traffic systems		●
CIV4288	Water treatment		●
ENE4044	AI applications for civil and environmental engineers		●
MTE4593	Materials and sustainability		●
CIV5148	Ground hazards engineering ¹	●	
ENG5331	Railway engineering ¹		●
You may also select a unit listed across the engineering minors to complete as an elective, provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, you must ensure that you continue to meet the elective requirements across Years 2, 3 and 4 and remain on track to complete 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.			

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Water engineering

Electives to take if you are interested in studying water engineering:

RSE3241	Hydropower		●
CIV4288	Water treatment		●

Materials engineering

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

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 level 5 units.

MTE3204	Biomaterials 1	●	
ENG4001	Special studies in engineering 1	×	×
MTE4235	Nuclear energy: Science, technology and society		●
MTE4590	Modelling of materials: From continuum to quantum		●
MTE4592	Advanced ceramics and applications	×	
MTE4593	Materials and sustainability		●
MTE4594	Engineering alloy design, processing and selection		×
MTE4595	Corrosion mechanisms and protection methods		×
MTE4596	Biomaterials 2		●
MTE4597	Engineering with nanomaterials	●	
MTE4598	Electron microscopy	×	
MTE5881	Quantum crystallography ¹		●
MTE5882	Advanced polymeric materials ¹	●	
MTE5883	Environmental durability and protection of metals and engineering materials ¹		●
MTE5884	Materials for energy technologies ¹	●	
MTE5885	Biomaterials and biomechanics ¹		●
MTE5886	Additive manufacturing of metallic materials ¹		●
MTE5887	Additive manufacturing of polymeric and functional materials ¹	●	
You may also select a unit listed across the engineering minors to complete as an elective, provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, you must ensure that you continue to meet the elective requirements across Years 2, 3 and 4 and remain on track to complete 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.			

Mechanical engineering

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

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 level 5 units.

MAE3001	Aero and gas dynamics	●	
MAE3411	Aerospace structural mechanics		●
MMA3101	Computational fluid dynamics	●	
MMA3102	Mechanics of composite materials		●
MMA3103	Linear algebra for robotics and engineering	Currently pending approval	
MEC4101	Airborne and waterborne acoustics		●
TRC4800	Robotics	●	
You may also select a unit listed across the engineering minors to complete as an elective, provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, you must ensure that you continue to meet the elective requirements across Years 2, 3 and 4 and remain on track to complete 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.

ECE2111	Signals and systems		●
ECE2191	Probability and AI for engineers		●
MMA2002	Solid mechanics 1	●	
ECE3051	Electrical energy systems	●	●
ECE3141	Information and networks	●	
ECE3142	Digital communication	●	
ECE3161	Analogue electronics		●

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Semester 1	Semester 2

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 level 5 units.

MMA3001 Numerical methods and machine learning		●
MMA3101 Computational fluid dynamics	●	
MMA3102 Mechanics of composite materials		●
MMA3103 Linear algebra – Proposed from 2027	Currently pending approval	
ECE4044 Telecommunication protocols	×	
ECE4045 Network performance	×	
ECE4053 Power system analysis		●
ECE4055 Power electronic converters for modern power systems	●	
ECE4078 Intelligent robotics		●
ECE4081 Medical instrumentation		●
ECE4146 Multimedia technologies	×	
ECE4886 Smart grids		●
ECE5881 Real time system design ¹	×	
ECE5882 Advanced electronics design ¹	●	
ECE5883 Advanced signal processing ¹	●	
ECE5884 Wireless communications ¹		●
You may also select a unit listed across the engineering minors to complete as an elective, provided it is an engineering unit and you meet the unit's prerequisite and/or co-requisite rules. When doing so, you must ensure that you continue to meet the elective requirements across Years 2, 3 and 4 and remain on track to complete 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 <i>must</i> 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		●
FIT3031 Network security	●	
FIT3080 Artificial intelligence		●
FIT3134 Entrepreneurship		×
FIT3138 Real time enterprise systems		●
FIT3139 Computational modelling and simulation	●	
FIT3143 Parallel computing		●
FIT3146 Maker lab	●	
FIT3152 Data analytics	●	●
FIT3154 Advanced data analysis		●
FIT3155 Advanced data structures and algorithms	●	●
FIT3168 IT forensics		●
FIT3174 IT strategy and governance	●	
FIT3176 Advanced database design	×	×
FIT3178 iOS app development		●
FIT3179 Data visualisation	●	
FIT3181 Deep learning		●
FIT3183 AI and dark side cybersecurity	●	
FIT3185 Privacy enhancing technologies	●	
FIT3186 Vulnerability analysis, response and mitigation		●
FIT3195 Deep tech entrepreneurship		●
FIT4005 IT research and innovation methods	×	×
FIT4190 Work integrated learning – Industry placement	●	●
FIT5032 Internet applications development		●
FIT5037 Network security		●
FIT5046 Mobile and distributed computing systems	●	●
FIT5124 Emerging topics for cybersecurity in practice	●	

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FIT5129	Cyber operations	●	
FIT5137	Advanced database technology		●
FIT5145	Foundations of data science	●	●
FIT5163	Introduction to cryptography for cybersecurity	●	●
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	●	
FIT5222	Planning and automated reasoning		●
FIT5223	IT forensics		●
FIT5225	Cloud computing and security	●	
FIT5233	Digital transformation, strategy and governance	●	

E3001 Bachelor of Engineering (Honours)

2027 Engineering minors available in Clayton

Update version: 1 October 2026

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.**

Note: Engineering minors are not available within the biomedical engineering and software engineering specialisations.

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.](#)

		Aerospace engineering	Chemical engineering	Civil engineering	Electrical & computer systems engineering	Environmental engineering	Materials engineering	Mechanical engineering	Robotics & mechatronics engineering
Engineering minors	Artificial intelligence in engineering	Available	Available	Available	Available	Available	Available	Available	Available Pre-2025 Automation stream only
	Civil engineering					Available			
	Environmental engineering		Available	Available					
	Medical technology See UPDATES below	Available		Available	Available	Available	Available	Available	Available
	Micro & nano technologies	Available	Available	Available	Available	Available	Available	Available	Available
	Mining engineering	Available	Available	Available	Available	Available	Available	Available	Available
	Renewable energy engineering	Available	Available	Available	Available	Available	Available	Available	Available
	Sustainable engineering	Available	Available	Available	Available		Available	Available	Available
	Transport	Available		Available	Available	Available	Available	Available	Available

NOTE:

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

UPDATES FOR MINORS	
IN TEACH-OUT – No longer open to new enrolments from 2027	- Computational engineering [MEC4447 : Replace with MMA3101] - Networks for connectivity - Power and energy systems engineering - Smart manufacturing - Telecommunications infrastructure
Artificial intelligence in engineering	ECE4179 : Replace with ECE3192
Medical technology	MEC4601 : Replace with MTE4597