MONASH University

MONASH ENGINEERING

E3001 Bachelor of Engineering (Honours)

Engineering minors in Clayton

Update version: 12 December 2024

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. If you do not complete the units that qualify for a minor, you must ensure you satisfy the course elective requirements for Years 2, 3 and 4: 12 credit points must be level 1, 2 or 3 engineering electives, not exceeding 60 credit points of level 1 units overall. Additionally, 24 credit points must be level 3 or 4 engineering electives from your specialisation. You may also enrol in up to two level 5 units in your final year if you meet the WAM requirement by the end of Year 3.

Engineering minors	Aerospace engineering	Chemical engineering	Civil engineering	Electrical & computer systems engineering	Environmental engineering	Materials engineering	Mechanical engineering	Robotics & mechatronics engineering	Software engineering
Artificial intelligence in engineering	Available	Available	Available	Available	Available	Available	Available	Available Automation stream only	
Civil engineering					Available				
Computational engineering	Available	Available	Available	Available	Available	Available	Available	Available	
Environmental engineering		Available	Available						
Medical technology	Available		Available	Available	Available	Available	Available	Available	
Micro & nano technologies See UPDATES below	Available	Available	Available	Available	Available	Available	Available	Available	
Mining engineering	Available	Available	Available	Available	Available	Available	Available	Available	
Networks for connectivity	Available		Available	Available	Available	Available	Available	Available	
Power and energy systems engineering	Available		Available	Available	Available	Available	Available	Available	
Renewable energy engineering	Available	Available	Available	Available	Available	Available	Available	Available	
Smart manufacturing See UPDATES below	Available	Available	Available	Available	Available	Available	Available	Available AI stream only	
Sustainable engineering	Available	Available	Available	Available		Available	Available	Available	
Telecommunications infrastructure	Available		Available	Available	Available	Available	Available	Available	
Transport	Available		Available	Available	Available	Available	Available	Available	

Note: Engineering minors are not available within the biomedical engineering specialisation.

UPDATES FOR MINORS

Engineering entrepreneurship IN TEACH-OUT – No longer open to new enrolments	ENG3701 : [From 2025] Replace with ENG5220 Organising the project function ENG3702 : [From 2025] Replace with ENG5221 Projects as a social system
Micro and nano technologies	MEC3010 : [From 2025] Replace with MTE3204 Biomaterials 1
Mining engineering	[From 2025] All engineering specialisations completing the minor can complete any combination of four units: RSE3010, RSE3020, RSE3040, RSE3060, RSE4010.
Networks for connectivity	[From 2025] ECE3093 Optimisation and numerical methods for engineers has been added as a prescribed unit in the minor and is available for selection by students in all participating specialisations.
Smart manufacturing	TRC3000 : [From 2025] Replace with ECE3093 Optimisation and numerical methods for engineers TRC4200 : [From 2025] ECSE specialisation replace with TRC3500 Sensors and artificial perception Other specialisations replace with ECE2191 Probability and AI for engineers or MEC2402 Design methods or TRC4800 Robotics

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Bachelor of Engineering (Honours)

2025 Technical electives in Clayton

Update version: 11 July 2025

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

First Year breadth study

BMS1021 Cells, tissues and organisms [1]	●	
CHE1010 Grand challenges in chemical engineering: Delivering sustainable food, water and energy		●
CHM1011 Chemistry 1 or CHM1051 Chemistry 1 advanced [4, 5]	●	
ENE1621 Environmental engineering	●	
ENG1021 Spatial communication in engineering		●
ENG1051 Materials for energy and sustainability		●
FIT1045 Introduction to programming [3]	●	●
FIT1056 Introduction to software engineering		●
PHS1002 Physics for engineering		●
RSE1010 Introduction to resources engineering		●
CHE2161 Mechanics of fluids [2, 5]		●
ECE2072 Digital systems [5]		●
MAE2505 Aerospace dynamics [5]		●
MEC2404 Mechanics of fluids [2, 5]		●
MTE2201 Plastics and the planet: Health, impact and sustainability [5]		●

[1] ***Biomedical engineering:*** *If you intend to specialise in biomedical engineering, you must complete BMS1021 as a First Year elective unit.*

[2] ***Chemical engineering:*** *If you intend to specialise in chemical engineering, you are strongly advised against completing MEC2404 or CHE2161 as a First Year elective. Choosing MEC2404, which is a prohibition unit to CHE2161, may result in an insufficient foundation for the subsequent core unit, CHE3167, in the chemical engineering specialisation. Instead, you are advised to choose another elective from the breadth study list*

[3] ***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.*

[4] *CHM1011 and CHE1051 are mutual prohibition units; you can only complete either CHM1011 or CHM1051.*

[5] ***NOTE: First Year engineering breadth unit that is also a core unit in your specialisation***
From 2025: The unit will count towards your specialisation study. You must still fulfil the First Year engineering breadth study requirement by completing another breadth study unit.

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 the level 5 units*

MEC3416 Machine design		●
TRC3500 Sensors and artificial perception	●	
ECE4078 Intelligent robotics		●
MEC4407 Design project		●
MEC4428 Advanced dynamics		✕
MEC4447 Computers in fluids and energy	●	
ENG5331 Railway engineering [1]		●
MEC5881 Engineering systems performance analysis [1]		●
MEC5882 Instrumentation, sensing and monitoring [1]	●	
MEC5883 Mechanical systems design [1]	●	
MEC5884 Sustainable engineering systems [1]		●
You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.		

		⭘ Offered ✕ Not offered Offerings are subject to change	
		Semester 1	Semester 2
Biomedical engineering If you are completing the biomedical engineering specialisation, your elective must be selected from this prescribed list.	ECE3141 Information and networks	⭘	
	PHY3111 Sensory and cognitive neuroscience	⭘	
	ECE4076 Computer vision	⭘	
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 the level 5 units.*	CHM2951 Environmental chemistry – Water	⭘	
	ECE2071 Computer organisation and programming	⭘	
	ECE2131 Electrical circuits	⭘	
	MTH2232 Mathematical statistics		⭘
	CHE3133 Food engineering	⭘	
	CHE3163 Sustainable processing 1	⭘	
	CHE3172 Nanotechnology and materials 1		⭘
	CHM3960 Environmental chemistry	⭘	
	TRC3500 Sensors and artificial perception	⭘	
	ENE4042 Environmental impact and risk assessment	⭘	
	CHE4172 Nanotechnology and materials 2		⭘
	CHE4173 Sustainable processing 2	⭘	
	ENG5002 Engineering entrepreneurship [1]		✕
	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]		⭘
	You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.		
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 the level 5 units.*	ENG1021 Spatial communication in engineering		⭘
	CIV2283 Civil engineering construction	⭘ Semester 1 Extended	
	CIV3283 Road engineering *(Available elective to students who commenced Civil Engineering before 2020)*		⭘
	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	✕	
	CIV4235 Advanced structural design		✕
	CIV4248 Ground hazards engineering		✕
	CIV4261 Integrated urban water management	✕	
	CIV4268 Water resources management		⭘
	CIV4283 Transport planning		✕

		⭘ Offered ✕ Not offered Offerings are subject to change	
		Semester 1	Semester 2
CIV4284	Sustainable traffic systems		⭘
CIV4293	Transport planning for Asian cities		✕
ENE4043	Quantifying sustainability in urban systems	⭘	
ENE4044	AI applications for civil and environmental engineers		⭘
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 consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.			

Electrical and computer systems engineering

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

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.*

MTE2202	Functional materials 1		⭘
ECE3093	Optimisation and numerical methods for engineers		⭘
ECE3142	Digital communication	⭘	
MEC3601	Mechanics for biomedical engineering	⭘	
MTE3202	Functional materials 2		⭘
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	⭘	
ECE4058	Electrical energy - high voltage engineering		✕
ECE4076	Computer vision	⭘	
ECE4078	Intelligent robotics		⭘
ECE4081	Medical instrumentation		⭘
ECE4086	Medical imaging technology		✕
ECE4087	Medical technology innovation		⭘
ECE4122	Advanced electromagnetics		⭘
ECE4146	Multimedia technologies	⭘	
ECE4179	Neural networks and deep learning		⭘
ECE4886	Smart grids		⭘
MEC4601	Implantable devices	⭘	
ECE5156	Advanced power electronics [1]		✕
ECE5881	Real-time system design [1]	✕	
ECE5882	Advanced electronics design [1]	⭘	
ECE5883	Advanced signal processing [1]	⭘	
ECE5884	Wireless communications [1]		⭘

		⭘ Offered ✕ Not offered Offerings are subject to change	
		Semester 1	Semester 2
	MEC5885 Energy efficiency and sustainability engineering [1]	⭘	
	You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.		

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 the level 5 units.*

	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		⭘
	BTX3100 Sustainability regulation for business *(Available elective to students who commenced Environmental Engineering before 2020)*	⭘	
	CHE3161 Chemistry and chemical thermodynamics	⭘	
	CHE3163 Sustainable processing 1	⭘	
	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		⭘
	CIV4261 Integrated urban water management	✕	
	CIV4268 Water resources management		⭘
	CIV4283 Transport planning		✕
	CIV4284 Sustainable traffic systems		⭘
	CIV4288 Water treatment		⭘
	ENE4044 AI applications for civil and environmental engineers		⭘
	MTE4593 Materials and sustainability		⭘
	ENG5331 Railway engineering [1]		⭘
	You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.		

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 the level 5 units.*

	MTE3204 Biomaterials 1	⭘	
	ENG4001 Special studies in engineering 1	⭘	⭘
	MEC4601 Implantable devices	⭘	
	MTE4235 Nuclear energy: Science, technology and society		⭘
	MTE4590 Modelling of materials		⭘
	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 Applied crystallography in advanced materials characterisation [1]		✕
	MTE5882 Advanced polymeric materials [1]	⭘	
	MTE5883 Environmental durability and protection of metals and engineering materials [1]		⭘

	● Offered ✕ Not offered Offerings are subject to change	
	Semester 1	Semester 2
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 consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.		

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 the level 5 units.*

ECE2131 Electrical circuits	●	
MAE2505 Aerospace dynamics		●
MEC3602 Biomedical microsystems		●
RSE3030 Ventilation for surface and underground spaces	✕	
RSE3241 Hydropower		●
TRC3500 Sensors and artificial perception	●	
ECE4179 Neural networks and deep learning		●
MEC4428 Advanced dynamics		✕
MEC4447 Computers in fluids and energy	●	
MEC4601 Implantable devices	●	
TRC4800 Robotics	●	
ENG5331 Railway engineering [1]		●
MEC5881 Engineering systems performance analysis [1]		●
MEC5882 Instrumentation, sensing and monitoring [1]	●	
MEC5883 Mechanical systems design [1]	●	
MEC5884 Sustainable engineering systems [1]		●
MEC5885 Energy efficiency and sustainability engineering [1]	●	
MEC5888 Renewable energy systems [1]		●
MEC5897 Lean manufacturing [1]		●
You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.		

Robotics and mechatronics 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 the level 5 units.*

ECE2111 Signals and systems		●
ECE2191 Probability and AI for engineers		●
MAE2505 Aerospace dynamics		●
ECE3051 Electrical energy systems	●	
ECE3141 Information and networks	●	
ECE3142 Digital communication	●	
ECE3161 Analogue electronics		●
MEC3416 Machine design		●
MEC3602 Biomedical microsystems		●
ECE4044 Telecommunication protocols	✕	
ECE4045 Network performance		●
ECE4053 Power system analysis		●
ECE4055 Power electronic converters	●	
ECE4076 Computer vision	●	
ECE4078 Intelligent robotics		●
ECE4081 Medical instrumentation		●
ECE4146 Multimedia technologies	●	
ECE4179 Neural networks and deep learning		●
ECE4886 Smart grids		●
MEC4426 Computer-aided design		●

		⭘ Offered ✕ Not offered Offerings are subject to change	
		Semester 1	Semester 2
MEC4428	Advanced dynamics		✕
MEC4601	Implantable devices	⭘	
TRC4902	Mechatronics and manufacturing		⭘
ECE5881	Real time system design [1]	✕	
ECE5882	Advanced electronics design [1]	⭘	
ECE5883	Advanced signal processing [1]	⭘	
ECE5884	Wireless communications [1]		⭘
MEC5881	Engineering systems performance analysis [1]		⭘
MEC5882	Instrumentation, sensing and monitoring [1]	⭘	
MEC5883	Mechanical systems design [1]	⭘	
MEC5884	Sustainable engineering systems [1]		⭘
MEC5885	Energy efficiency and sustainability engineering [1]	⭘	
MEC5888	Renewable energy systems [1]		⭘
You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.			

Software engineering

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

1005 3
1013 1
1045 1
1047 1
1830 1
2004 3
2085 4
2086 4
2093 2
2099 6
2100 2
3080 2
3171 5
4165 7
5163 1

4165
2099
3171
2085 2086
2004 1005
2093 2100 3080
1013 1045 1047 1830 5163

FIT3003	Business intelligence and data warehousing			⭘
FIT3031	Network security	2093, 1047		⭘
FIT3080	Artificial intelligence			⭘
FIT3138	Real time enterprise systems	12 points of lvl 2 unit		⭘
FIT3139	Computational modelling and simulation	1005, 2085	⭘	
FIT3143	Parallel computing			⭘
FIT3146	Maker lab	1013		⭘
FIT3152	Data analytics	2086, 3171	⭘	⭘
FIT3154	Advanced data analysis	2086		⭘
FIT3155	Advanced data structures and algorithms		⭘	⭘
FIT3168	IT forensics	2093, 2100		⭘
FIT3169	Immersive environments		✕	
FIT3173	Software security	1045, 2100	⭘	
FIT3175	Usability	2085	⭘	
FIT3176	Advanced database design	3171		⭘
FIT3178	iOS app development	2085		⭘
FIT3179	Data visualisation			⭘
FIT3182	Big data management and processing	2004, 3171	✕	
FIT4005	IT research and innovation methods	6 sem	⭘	⭘
FIT5003	Software security	2099		⭘
FIT5032	Internet applications development	2099		⭘
FIT5037	Network security	4165		⭘
FIT5046	Mobile and distributed computing systems	2099, 3171, 4165	⭘	
FIT5124	Emerging topics for cybersecurity in practice	5163/4165	⭘	
FIT5129	Cyber operations	4165	⭘	
FIT5137	Advanced database technology	3171		⭘
FIT5145	Foundations of data science	2099	⭘	⭘
FIT5163	Introduction to cryptography for cybersecurity	4165	⭘	⭘
FIT5201	Machine learning		⭘	⭘
FIT5202	Data processing for big data			⭘
FIT5215	Deep learning			⭘
FIT5216	Modelling discrete optimisation problems	2099	⭘	
FIT5217	Natural language processing	3181/5215 OR 1005, 3080	⭘	
FIT5221	Intelligent image and video analysis	2004, 2086	⭘	

			⊙ Offered ✕ Not offered Offerings are subject to change	
			Semester 1	Semester 2
FIT5222	Planning and automated reasoning	3080		⊙
FIT5223	IT forensics	4165		⊙
FIT5225	Cloud computing and security	4165, 2099	⊙	