

Bachelor of Engineering (Honours)

Technical electives

 Offerings may change
year-to-year

Clayton	Malaysia	Caulfield
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First Year

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	●	●	
ENE1621 Environmental engineering	●		
ENG1021 Spatial communication in engineering ²	●	●	
ENG1051 Materials for energy and sustainability	●		
ENG1811 Engineering design C: Automated, integrated and connected world			●
MAT1830 Discrete mathematics for computer science	●	●	
PHS1002 Physics for engineering	●	●	
RSE1010 Introduction to resources engineering	●		
ECE2071 Computer organisation and programming	●	●	
ECE2072 Digital systems	●	●	
ENG2801 Leadership and innovation ²			●
FIT2085 Introduction to computer science for engineers	●	●	
MAE2505 Aerospace dynamics	●		
MEC2404 Mechanics of fluids	●	●	
TRC2001 Introduction to systems engineering	●	●	

¹ Biomedical engineering

specialisation: If you are planning to specialise in Biomedical engineering, you must complete BMS1021 as a First Year elective unit.

² **Accreditation in Malaysia:** If you plan to seek accreditation in Malaysia, the Malaysian Ministry of Education requires you to complete [ENG2801](#) to meet general studies requirements. If you plan to specialise in Civil Engineering, the Engineering Accreditation Council Malaysia requires you to also complete [ENG1021](#) for accreditation.

Aerospace engineering

MEC2407 Electromechanics	●	●	
ENG3101 Engineering education placement	●		
MAE3406 Aerospace materials	●		
MEC3010 Micro and nanotechnologies: Fabrication and applications	●		
MEC3416 Engineering design 2	●	●	
MEC3448 Engineering technologies	●	●	
TRC3000 Automation project	●	●	
TRC3500 Sensors and artificial perception	●	●	
ECE4078 Intelligent robotics	●		
MAE4409 Wing design	●		
MAE4965 Advanced aerodynamics and turbulence	●		
MAE4980 Aircraft engines	●		
MEC4407 Design project	●	●	
MEC4418 Control systems	●	●	
MEC4428 Advanced dynamics	●		
MEC4447 Computers in fluids and energy	●		
MEC4459 Wind engineering	●		

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.

TRC4200 Engineering cyber-physical systems	•	•
MEC5881 Engineering systems performance analysis ¹	•	
MEC5882 Instrumentation, sensing and monitoring ¹	•	
MEC5883 Mechanical systems design ¹	•	
MEC5884 Sustainable engineering systems ¹	•	
Or an approved engineering technical elective chosen in consultation with the course adviser		

Chemical engineering

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.

* **Industry 4.0 units**

CHE2166 Introduction to process simulation	•	•
CHE2167 Process material selection	•	•
CHE2871 Biochemistry for engineers		•
CHE2873 Introduction to chemical processes		•
CHM2951 Environmental chemistry – Water	•	
ECE2071 Computer organisation and programming *	•	•
ECE2131 Electrical circuits *	•	•
MTH2232 Mathematical statistics	•	
CHE3133 Food engineering	•	
CHE3163 Sustainable processing ¹	•	•
CHE3171 Bioprocess technology	•	•
CHE3172 Nanotechnology and materials ¹	•	•
CHE3873 Pilot plant project		•
CHM3960 Environmental chemistry	•	
ENG3101 Engineering education placement	•	
TRC3500 Sensors and artificial perception *	•	•
ENE4042 Environmental impact and risk assessment	•	
CHE4171 Biochemical engineering	•	•
CHE4172 Nanotechnology and materials ²	•	•
CHE4173 Sustainable processing ²	•	•
ENG5002 Engineering entrepreneurship	•	
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	•	
CHE5885 Principles and practices for sustainable development ¹		•
CHE5889 Food engineering and processing ¹	•	
Or an approved engineering technical elective chosen in consultation with the course adviser		

Civil engineering

¹ **Accreditation in Malaysia:** If you plan to seek accreditation with Engineering Accreditation Council (EAC) Malaysia, you must complete ENG1021.

ENG1021 Spatial communication in engineering ¹	•	•
CIV2283 Civil engineering construction	•	•
ENE2503 Material properties and recycling	•	
RSE2010 Fixed plant engineering and project management	•	
ENG3101 Engineering education placement	•	
RSE3010 Mine geotechnical engineering	•	
RSE3020 Resource estimation	•	

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.

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	●		
CIV4211 Project B	●	●	
CIV4234 Advanced structural analysis	●	●	
CIV4235 Advanced structural design	●	●	
CIV4248 Ground hazards engineering	●	●	
CIV4249 Foundation engineering	●	●	
CIV4261 Integrated urban water management	●	●	
CIV4268 Water resources management	●	●	
CIV4283 Transport planning	●	●	
CIV4284 Traffic systems	●	●	
CIV4293 Transport planning for Asian cities	●		
CIV5301 Advanced traffic engineering ²	●		
CIV5302 Traffic engineering and management ²	●		
CIV5304 Intelligent transport systems ²	●		
CIV5314 Planning urban mobility futures ²	●		
CIV5881 Ground water hydraulics ²	●		
CIV5882 Flood hydraulics and hydrology ²	●		
CIV5883 Surface water hydrology ²	●		
CIV5884 Water sensitive storm water design ²	●		
CIV5885 Infrastructure dynamics ²	●		
CIV5886 Infrastructure geomechanics ²	●		
CIV5887 Infrastructure rehabilitation and monitoring ²	●		
CIV5888 Advanced computational methods ²	●		
CIV5899 Infrastructure information management ²	●		
Or an approved engineering technical elective chosen in consultation with the course adviser			

Electrical and computer systems engineering

TRC2001 Introduction to systems engineering	●	●
ECE3093 Optimisation estimation and numerical methods	●	●
ENG3101 Engineering education placement	●	
RSE3141 Solar energy	●	
TRC3500 Sensors and artificial perception	●	●
ECE4032 Advanced control		●
ECE4033 Industrial instrumentation and measurement technologies		●
ECE4042 Communications theory	●	●
ECE4043 Optical communications	●	●
ECE4044 Telecommunications protocols	●	●
ECE4045 Network performance	●	●
ECE4053 Power system analysis	●	●
ECE4055 Power electronic converters	●	

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.

Offerings may change
year-to-year

Clayton
Malaysia
Caulfield

ECE4058 Electrical energy - high voltage engineering	●		
ECE4063 Large scale digital design		●	
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	●	●	
ECE4808 Organic electronics and micro devices		●	
ECE4809 Solid state lighting		●	
ECE4810 Internet of things: Communication, data and security		●	
ENG4700 Engineering technology for biomedical imaging and sensing	●		
TRC4901 Artificial intelligence for engineers		●	
ECE5156 Advanced power electronics ¹	●		
ECE5881 Real-time system <i>design</i> ¹	●		
ECE5882 Advanced electronics design ¹	●		
ECE5883 Advanced signal processing ¹	●		
ECE5884 Wireless communications ¹	●		
ECE5886 Smart grids ¹	●	●	
Or an approved engineering technical elective chosen in consultation with the course adviser			

Environmental engineering

ATS2548 Environmental policy and management	●		
BIO2011 Ecology and biodiversity	●		
BIO2040 Conservation biology	●		
CIV2242 Geomechanics 1	●	●	
CIV2282 Transport and traffic engineering	●	●	
ECC2800 Prosperity, poverty and sustainability in a globalised world	●		
CHE3161 Chemistry and chemical thermodynamics	●	●	
CHE3163 Sustainable processing 1	●	●	
CHE3165 Separation processes	●	●	
CHE3166 Process design	●	●	
CIV3204 Engineering investigation	●	●	
CIV3247 Geomechanics 2	●	●	
ENG3101 Engineering education placement	●		
RSE3020 Resource estimation	●		
RSE3030 Ventilation for surface and underground spaces	●		
RSE3040 Mining systems	●		
RSE3060 Rock breakage	●		
RSE3141 Solar energy	●		
RSE3241 Hydropower	●		
RSE3243 Bioenergy	●		
CIV4211 Project B	●	●	
CIV4248 Ground hazards engineering	●	●	
CIV4249 Foundation engineering	●	●	

CIV4261 Integrated urban water management	●	●
CIV4268 Water resources management	●	●
CIV4283 Transport planning	●	●
CIV4284 Traffic systems	●	●
CIV4287 Road engineering	●	●
CIV4288 Water treatment	●	●
MTE4593 Materials and sustainability	●	
Or an approved engineering technical elective chosen in consultation with the course adviser		

Materials engineering

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.

ENG3101 Engineering education placement	●	
MTE3204 Biomaterials 1	●	
MTE3544 Management and practice in materials engineering	●	
ENG4700 Engineering technology for biomedical imaging and sensing	●	
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	●	
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	●	
Or an approved engineering technical elective chosen in consultation with the course adviser		

Mechanical engineering

¹ **Accreditation in Malaysia:** If you plan to register as a Mechanical Engineer with the Board of Engineers Malaysia (BEM), you must complete MEC3459.

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.

ECE2131 Electrical circuits	●	●
MAE2505 Aerospace dynamics	●	
MEC2407 Electromechanics	●	●
TRC2001 Introduction to systems engineering	●	●
ENG3101 Engineering education placement	●	
MEC3010 Micro and nanotechnologies: Fabrication and applications	●	
MEC3448 Engineering technologies	●	●
MEC3458 Experimental project	●	●
MEC3459 Materials selection for engineering design ¹	●	●
MEC3800 Introduction to reliability engineering		●
MEC3828 Biomedical engineering and healthcare system		●
RSE3030 Ventilation for surface and underground spaces	●	
RSE3241 Hydropower	●	
TRC3000 Automation project	●	●
TRC3500 Sensors and artificial perception	●	●

ECE4179 Neural networks and deep learning	●	●
ENG4700 Engineering technology for biomedical imaging and sensing	●	
MEC4416 Momentum, energy and mass transport in engineering systems		●
MEC4417 Refrigeration and air-conditioning		●
MEC4418 Control systems	●	●
MEC4425 Micro/nano solid and fluid mechanics	●	
MEC4428 Advanced dynamics	●	
MEC4444 Industrial noise and control	●	●
MEC4446 Composite structures	●	
MEC4447 Computers in fluids and energy	●	
MEC4456 Robotics	●	
MEC4459 Wind engineering	●	
MEC4801 Non-destructive testing and inspection		●
MEC4802 Sustainable engineering and design with nanomaterials		●
MEC4803 Internal combustion engines		●
MEC4804 Clean energy materials		●
TRC4200 Engineering cyber-physical systems	●	●
TRC4800 Robotics	●	●
TRC4901 Artificial intelligence for engineers		●
MEC5881 Engineering systems performance analysis ²	●	
MEC5882 Instrumentation, sensing and monitoring ²	●	
MEC5883 Mechanical systems design ²	●	
MEC5884 Sustainable engineering systems ²	●	
MEC5885 Energy efficiency and sustainability engineering ²	●	●
MEC5886 Sustainable energy technologies ²		●
MEC5887 Environmental and air pollution control ²		●
MEC5888 Renewable energy systems ²	●	
MEC5891 Design for additive manufacturing ²	●	
Or an approved engineering technical elective chosen in consultation with the course adviser		

Resources and mining engineering

ATS2548 Environmental policy and management	●	
CHE2163 Heat and mass transfer	●	●
EAE2522 Earth surface dynamics	●	
ENE2021 Energy and the environment	●	
MEC2405 Thermodynamics	●	●
CHE3163 Sustainable processing 1	●	●
CIV3204 Engineering investigation	●	●
CIV3247 Geomechanics 2	●	●
CIV3248 Groundwater and environmental geomechanics	●	●
ENG3101 Engineering education placement	●	
RSE3141 Solar energy	●	
RSE3241 Hydropower	●	
RSE3242 Geothermal energy	●	
RSE3243 Bioenergy	●	
CIV4248 Ground hazards engineering	●	●
CIV4268 Water resources management	●	●

CIV4288 Water treatment	●	●
CIV4249 Foundation engineering	●	●
MTE4593 Materials and sustainability	●	
Or an approved engineering technical elective chosen in consultation		

Resources and renewable energy engineering

ATS2548 Environmental policy and management	●	
CHE2163 Heat and mass transfer	●	●
EAE2522 Earth surface dynamics	●	
ENE2021 Energy and the environment	●	
MEC2405 Thermodynamics	●	●
CIV3204 Engineering investigation	●	●
CIV3247 Geomechanics 2	●	●
CIV3248 Groundwater and environmental geomechanics	●	●
ENE3031 Building sustainability	●	
ENE3032 Fate and transport of contaminants	●	
ENE3606 The air environment	●	
ENG3101 Engineering education placement	●	
RSE3010 Mine geotechnical engineering	●	
RSE3020 Resources estimation	●	
RSE3030 Ventilation for surface and underground spaces	●	
RSE3040 Mining systems	●	
RSE3060 Rock breakage	●	
CIV4248 Ground hazards engineering	●	●
CIV4268 Water resources management	●	●
CIV4288 Water treatment	●	●
RSE4010 Mine planning and scheduling	●	
Or an approved engineering technical elective chosen in consultation with the course adviser		

Robotics and mechatronics engineering

ECE2111 Signals and systems	●	●
MAE2505 Aerospace dynamics	●	
MEC2407 Electromechanics	●	●
TRC2001 Introduction to systems engineering	●	●
ECE3051 Electrical energy systems ¹	●	●
ECE3073 Computer systems	●	●
ECE3141 Information and networks	●	●
ENG3101 Engineering education placement	●	
MEC3010 Micro and nanotechnologies: Fabrication and applications	●	
MEC3416 Engineering design 2	●	●
MEC3448 Engineering technologies	●	●
MEC3459 Materials selection for engineering design	●	●
MTE3545 Functional materials and devices	●	
ECE4032 Advanced control		●
ECE4044 Telecommunication protocols	●	●
ECE4045 Network performance	●	●

¹ **Accreditation in Malaysia:** If you plan to seek accreditation with the Engineering Accreditation Council Malaysia (EAC), you must complete ECE3051 and TRC4802.

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.

Offerings may change
year-to-year

	Clayton	Malaysia	Caulfield
ECE4053 Power system analysis	●	●	
ECE4055 Power electronic converters	●		
ECE4063 Large scale digital design		●	
ECE4081 Medical instrumentation	●		
ECE4076 Computer vision	●	●	
ECE4078 Intelligent robotics	●		
ECE4146 Multimedia technologies	●	●	
ECE4179 Neural networks and deep learning	●	●	
ENG4700 Engineering technology for biomedical imaging and sensing	●		
MEC4416 Momentum, energy and mass transport in engineering systems		●	
MEC4417 Refrigeration and air-conditioning		●	
MEC4425 Micro/nano solid and fluid mechanics	●		
MEC4426 Computer-aided design	●	●	
MEC4428 Advanced dynamics	●		
MEC4444 Industrial noise and control	●	●	
MEC4446 Composite structures	●		
MEC4801 Non-destructive testing and inspection		●	
MEC4802 Sustainable engineering and design with nanomaterials		●	
TRC4200 Engineering cyber-physical systems	●	●	
TRC4802 Thermo-fluids and power systems ¹	●	●	
TRC4901 Artificial intelligence for engineers		●	
TRC4902 Mechatronics and manufacturing	●	●	
ECE5881 Real time system design ²	●		
ECE5886 Smart grids ²	●	●	
MEC5881 Engineering systems performance analysis ²	●		
MEC5882 Instrumentation, sensing and monitoring ²	●		
MEC5883 Mechanical systems design ²	●		
MEC5884 Sustainable engineering systems ²	●		
MEC5885 Energy efficiency and sustainability engineering ²	●	●	
MEC5886 Sustainable energy technologies ²		●	
MEC5888 Renewable energy systems ²	●		
MEC5891 Design for additive manufacturing ²	●		
Or an approved engineering technical elective chosen in consultation with the course adviser			
Software engineering			
ENG3101 Engineering education placement	●		
FIT3003 Business intelligence and data warehousing	●	●	
FIT3031 Network security	●	●	
FIT3080 Intelligent systems	●	●	
FIT3081 Image processing		●	
FIT3094 Artificial life, artificial intelligence and virtual environments	●		
FIT3134 Entrepreneurship	●	●	●
FIT3138 Real time enterprise systems	●		
FIT3139 Computational modelling and simulation	●		
FIT3142 Distributed computing	●		
FIT3143 Parallel computing	●	●	
FIT3146 Maker lab	●		

Offerings may change
year-to-year

	Clayton	Malaysia	Caulfield
FIT3152 Data analytics	●	●	
FIT3154 Advanced data analysis	●		
FIT3155 Advanced data structures and algorithms	●	●	
FIT3157 Advanced web design	●		
FIT3168 IT forensics	●		
FIT3169 Immersive environments	●		
FIT3173 Software security	●		
FIT3175 Usability	●	●	
FIT3176 Advanced database design	●		
FIT3178 Advanced mobile applications	●		
FIT3179 Data visualisation	●	●	
FIT3183 Malicious AI and dark side security		●	
FIT4005 Research methods in information technology	●	●	
FIT4009 Advanced topics in intelligent systems		●	
FIT5003 Software security	●		
FIT5032 Internet application development	●		
FIT5037 Network security	●		●
FIT5042 Enterprise application development on the web	●		●
FIT5046 Mobile and distributed computing systems	●		
FIT5124 Advanced topics in security	●		●
FIT5129 Enterprise IT security – planning, operations and management	●		
FIT5133 Enterprise architecture and management	●	●	●
FIT5137 Advanced database technology	●		●
FIT5138 Advanced software engineering	●		●
FIT5140 Advanced mobile systems	●		●
FIT5145 Introduction to data science	●		●
FIT5163 Information and computer security	●		●
FIT5166 Information retrieval systems	●		
FIT5201 Machine learning	●		●
FIT5202 Data processing for big data	●	●	●
FIT5214 Blockchain	●		●
FIT5215 Deep learning	●		
FIT5216 Modelling discrete optimisation problems	●		
FIT5217 Natural language processing	●		
FIT5218 Human-centric AI	●		
FIT5219 Advanced learning and cognitive systems	●		
FIT5220 Solving discrete optimisation problems	●		
FIT5221 Intelligent image and video analysis	●		
FIT5222 Planning and automated reasoning	●		
FIT5223 IT forensics	●		
FIT5224 Smart contracts	●		
FIT5225 Cloud computing and security	●		
Or an approved engineering technical elective chosen in consultation with the course adviser			

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Aerospace engineering specialisation

Available minors

The Environmental engineering and Civil engineering minors are not available within the Aerospace engineering specialisation.

Artificial intelligence in engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#)))

You must complete the four units (24 cp) below

- [ECE3093](#) Optimisation estimation and numerical methods
- [FIT3179](#) Data visualisation
- [MEC4447](#) Computers in fluids and energy
- [MTE4590](#) Modelling of materials

Micro and nano technologies

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + [CHM1011](#))

You must complete the four units (24 cp) below

- [MEC3010](#) Micro and nanotechnologies: Fabrication and applications
- [CHE3172](#) Nanotechnology and materials 1
- [MTE4597](#) Engineering with nanomaterials
- [CHE4172](#) Nanotechnology and materials 2

Mining engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3020](#) Resource estimation
- [RSE3040](#) Mining systems
- [RSE4010](#) Mine planning and scheduling
- [RSE3030](#) Ventilation for surface and underground spaces

Renewable energy engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3141](#) Solar energy
- [RSE3241](#) Hydropower
- [RSE3242](#) Geothermal energy
- [RSE3243](#) Bioenergy

Smart manufacturing

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE3141](#) Information and networks
- [TRC3000](#) Automation project
- [TRC4200](#) Engineering cyber-physical systems
- [TRC4902](#) Mechatronics and manufacturing

Sustainable engineering

PREREQUISITES TO UNDERTAKE THE MINOR
[ENG2005](#). If you plan to take [CHE3163](#) in the minor, you must also have completed [CHE2162](#) prior

You must complete four units (24 cp) from below

- [CHE3163](#) Sustainable processing 1 or [ENE3031](#) Building sustainability
- [MTE4593](#) Materials and sustainability
- [ENE4042](#) Environmental impact and risk assessment
- [CIV4268](#) Water resources management or [CHE4173](#) Sustainable processing 2

Chemical engineering specialisation

Available minors

The Environmental engineering and Civil engineering minors are not available within the Chemical engineering specialisation. Minors are available in Clayton only.

Artificial intelligence in engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#)))

You must complete the four units (24 cp) below

- [ECE3093](#) Optimisation estimation and numerical methods
- [FIT3179](#) Data visualisation
- [MEC4447](#) Computers in fluids and energy
- [MTE4590](#) Modelling of materials

Micro and nano technologies

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + [CHM1011](#))

You must complete the four units (24 cp) below

- [MEC3010](#) Micro and nanotechnologies: Fabrication and applications
- [CHE3172](#) Nanotechnology and materials 1
- [MTE4597](#) Engineering with nanomaterials
- [CHE4172](#) Nanotechnology and materials 2

Mining engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3020](#) Resource estimation
- [RSE3040](#) Mining systems
- [RSE4010](#) Mine planning and scheduling
- [RSE3030](#) Ventilation for surface and underground spaces

Renewable energy engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3141](#) Solar energy
- [RSE3241](#) Hydropower
- [RSE3242](#) Geothermal energy
- [RSE3243](#) Bioenergy

Smart manufacturing

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE3141](#) Information and networks
- [TRC3000](#) Automation project
- [TRC4200](#) Engineering cyber-physical systems
- [TRC4902](#) Mechatronics and manufacturing

Sustainable engineering

PREREQUISITES TO UNDERTAKE THE MINOR
[ENG2005](#). If you plan to take [CHE3163](#) in the minor, you must also have completed [CHE2162](#) prior

You must complete four units (24 cp) from below

- [CHE3163](#) Sustainable processing 1 or [ENE3031](#) Building sustainability
- [MTE4593](#) Materials and sustainability
- [ENE4042](#) Environmental impact and risk assessment
- [CIV4268](#) Water resources management or [CHE4173](#) Sustainable processing 2

Civil engineering specialisation

Available minors

Minors are available in Clayton only.

Artificial intelligence in engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#)))

You must complete the four units (24 cp) below

- [ECE3093](#) Optimisation estimation and numerical methods
- [FIT3179](#) Data visualisation
- [MEC4447](#) Computers in fluids and energy
- [MTE4590](#) Modelling of materials

Environmental engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must select and complete four units (24 cp) from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [ENE3032](#) Fate and transport of contaminants
- [ENE3606](#) The air environment
- [ENE4041](#) Soil remediation and solid waste management
- [ENE4042](#) Environmental impact and risk assessment

Micro and nano technologies

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + [CHM1011](#))

You must complete the four units (24 cp) below

- [MEC3010](#) Micro and nanotechnologies: Fabrication and applications
- [CHE3172](#) Nanotechnology and materials 1
- [MTE4597](#) Engineering with nanomaterials
- [CHE4172](#) Nanotechnology and materials 2

Mining engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3020](#) Resource estimation
- [RSE3040](#) Mining systems
- [RSE3060](#) Rock breakage
- [RSE3010](#) Mine geotechnical engineering

Renewable energy engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3141](#) Solar energy
- [RSE3241](#) Hydropower
- [RSE3242](#) Geothermal energy
- [RSE3243](#) Bioenergy

Smart manufacturing

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE3141](#) Information and networks
- [TRC3000](#) Automation project
- [TRC4200](#) Engineering cyber-physical systems
- [TRC4902](#) Mechatronics and manufacturing

Sustainable engineering

PREREQUISITES TO UNDERTAKE THE MINOR
[ENG2005](#). If you plan to take [CHE3163](#) in the minor, you must also have completed [CHE2162](#) prior

You must complete four units (24 cp) from below

- [CHE3163](#) Sustainable processing 1 or [ENE3031](#) Building sustainability
- [MTE4593](#) Materials and sustainability
- [ENE4042](#) Environmental impact and risk assessment
- [CIV4268](#) Water resources management or [CHE4173](#) Sustainable processing 2

Electrical and computer systems engineering specialisation

Available minors

The Environmental engineering and Civil engineering minors are not available within the Electrical and computer systems engineering specialisation. Minors are available in Clayton only.

Artificial intelligence in engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [CIV4100](#) Autonomous vehicle systems
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#)))

You must complete the four units (24 cp) below

- [ECE3093](#) Optimisation estimation and numerical methods
- [FIT3179](#) Data visualisation
- [MEC4447](#) Computers in fluids and energy
- [MTE4590](#) Modelling of materials

Micro and nano technologies

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + [CHM1011](#))

You must complete the four units (24 cp) below

- [MEC3010](#) Micro and nanotechnologies: Fabrication and applications
- [CHE3172](#) Nanotechnology and materials 1
- [MTE4597](#) Engineering with nanomaterials
- [CHE4172](#) Nanotechnology and materials 2

Mining engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3020](#) Resource estimation
- [RSE3040](#) Mining systems
- [RSE4010](#) Mine planning and scheduling
- [RSE3030](#) Ventilation for surface and underground spaces

Renewable energy engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3141](#) Solar energy
- [RSE3241](#) Hydropower
- [RSE3242](#) Geothermal energy
- [RSE3243](#) Bioenergy

Smart manufacturing

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [MEC2402](#) Design methods
- [TRC3000](#) Automation project
- [TRC4200](#) Engineering cyber-physical systems
- [TRC4902](#) Mechatronics and manufacturing

Sustainable engineering

PREREQUISITES TO UNDERTAKE THE MINOR
[ENG2005](#). If you plan to take [CHE3163](#) in the minor, you must also have completed [CHE2162](#) prior

You must complete four units (24 cp) from below

- [CHE3163](#) Sustainable processing 1 or [ENE3031](#) Building sustainability
- [MTE4593](#) Materials and sustainability
- [ENE4042](#) Environmental impact and risk assessment
- [CIV4268](#) Water resources management or [CHE4173](#) Sustainable processing 2

Environmental engineering specialisation

Available minors

The Sustainable engineering minor is not available within the Environmental engineering specialisation.

[Artificial intelligence in engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

[Civil engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete four units (24 cp) below

- [CIV2282](#) Transport and traffic engineering
- [CIV2235](#) Structural materials or [CIV2206](#) Structural mechanics
- [CIV2242](#) Geomechanics
- [CIV4288](#) Water treatment

[Computational engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#)))

You must complete the four units (24 cp) below

- [ECE3093](#) Optimisation estimation and numerical methods
- [FIT3179](#) Data visualisation
- [MEC4447](#) Computers in fluids and energy
- [MTE4590](#) Modelling of materials

[Micro and nano technologies](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + [CHM1011](#))

You must complete the four units (24 cp) below

- [MEC3010](#) Micro and nanotechnologies: Fabrication and applications
- [CHE3172](#) Nanotechnology and materials 1
- [MTE4597](#) Engineering with nanomaterials
- [CHE4172](#) Nanotechnology and materials 2

[Mining engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3020](#) Resource estimation
- [RSE3040](#) Mining systems
- [RSE4010](#) Mine planning and scheduling
- [RSE3030](#) Ventilation for surface and underground spaces

[Renewable energy engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3141](#) Solar energy
- [RSE3241](#) Hydropower
- [RSE3242](#) Geothermal energy
- [RSE3243](#) Bioenergy

[Smart manufacturing](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE3141](#) Information and networks
- [TRC3000](#) Automation project
- [TRC4200](#) Engineering cyber-physical systems
- [TRC4902](#) Mechatronics and manufacturing

Materials engineering specialisation

Available minors

The Environmental engineering and Civil engineering minors are not available within the Materials engineering specialisation.

Artificial intelligence in engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#)))

You must complete the four units (24 cp) below

- [ECE3093](#) Optimisation estimation and numerical methods
- [FIT3179](#) Data visualisation
- [MEC4447](#) Computers in fluids and energy
- [MTE4590](#) Modelling of materials

Micro and nano technologies

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + [CHM1011](#))

You must complete the four units (24 cp) below

- [MEC3010](#) Micro and nanotechnologies: Fabrication and applications
- [CHE3172](#) Nanotechnology and materials 1
- [MTE4597](#) Engineering with nanomaterials
- [CHE4172](#) Nanotechnology and materials 2

Mining engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3020](#) Resource estimation
- [RSE3040](#) Mining systems
- [RSE4010](#) Mine planning and scheduling
- [RSE3030](#) Ventilation for surface and underground spaces

Renewable energy engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3141](#) Solar energy
- [RSE3241](#) Hydropower
- [RSE3242](#) Geothermal energy
- [RSE3243](#) Bioenergy

Smart manufacturing

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE3141](#) Information and networks
- [TRC3000](#) Automation project
- [TRC4200](#) Engineering cyber-physical systems
- [TRC4902](#) Mechatronics and manufacturing

Sustainable engineering

PREREQUISITES TO UNDERTAKE THE MINOR
[ENG2005](#). If you plan to take [CHE3163](#) in the minor, you must also have completed [CHE2162](#) prior

You must complete four units (24 cp) from below

- [CHE3163](#) Sustainable processing 1 or [ENE3031](#) Building sustainability
- [MTE4593](#) Materials and sustainability
- [ENE4042](#) Environmental impact and risk assessment
- [CIV4268](#) Water resources management or [CHE4173](#) Sustainable processing 2

Mechanical engineering specialisation

Available minors

The Environmental engineering and Civil engineering minors are not available within the Mechanical engineering specialisation. Minors are available in Clayton only.

[Artificial intelligence in engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

[Computational engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#)))

You must complete the four units (24 cp) below

- [ECE3093](#) Optimisation estimation and numerical methods
- [FIT3179](#) Data visualisation
- [MEC4447](#) Computers in fluids and energy
- [MTE4590](#) Modelling of materials

[Micro and nano technologies](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + [CHM1011](#))

You must complete the four units (24 cp) below

- [MEC3010](#) Micro and nanotechnologies: Fabrication and applications
- [CHE3172](#) Nanotechnology and materials 1
- [MTE4597](#) Engineering with nanomaterials
- [CHE4172](#) Nanotechnology and materials 2

[Mining engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3020](#) Resource estimation
- [RSE3040](#) Mining systems
- [RSE4010](#) Mine planning and scheduling
- [RSE3030](#) Ventilation for surface and underground spaces

[Renewable energy engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3141](#) Solar energy
- [RSE3241](#) Hydropower
- [RSE3242](#) Geothermal energy
- [RSE3243](#) Bioenergy

[Smart manufacturing](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE3141](#) Information and networks
- [TRC3000](#) Automation project
- [TRC4200](#) Engineering cyber-physical systems
- [TRC4902](#) Mechatronics and manufacturing

[Sustainable engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
[ENG2005](#). If you plan to take [CHE3163](#) in the minor, you must also have completed [CHE2162](#) prior

You must complete four units (24 cp) from below

- [CHE3163](#) Sustainable processing 1 or [ENE3031](#) Building sustainability
- [MTE4593](#) Materials and sustainability
- [ENE4042](#) Environmental impact and risk assessment
- [CIV4268](#) Water resources management or [CHE4173](#) Sustainable processing 2

Resources and mining engineering specialisation

Available minors

The Mining engineering minor is not available within the Resources and mining engineering specialisation.

Artificial intelligence in engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Civil engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must select and complete four units (24 cp) from below

- [CIV2282](#) Transport and traffic engineering
- [CIV2235](#) Structural materials
- [CIV3285](#) Engineering hydrology
- [CIV3247](#) Geomechanics 2

Computational engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#)))

You must complete the four units (24 cp) below

- [ECE3093](#) Optimisation estimation and numerical methods
- [FIT3179](#) Data visualisation
- [MEC4447](#) Computers in fluids and energy
- [MTE4590](#) Modelling of materials

Environmental engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must select and complete four units (24 cp) from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [ENE3032](#) Fate and transport of contaminants
- [ENE3606](#) The air environment
- [ENE4041](#) Soil remediation and solid waste management
- [ENE4042](#) Environmental impact and risk assessment

Micro and nano technologies

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + [CHM1011](#))

You must complete the four units (24 cp) below

- [MEC3010](#) Micro and nanotechnologies: Fabrication and applications
- [CHE3172](#) Nanotechnology and materials 1
- [MTE4597](#) Engineering with nanomaterials
- [CHE4172](#) Nanotechnology and materials 2

Renewable energy engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3141](#) Solar energy
- [RSE3241](#) Hydropower
- [RSE3242](#) Geothermal energy
- [RSE3243](#) Bioenergy

Smart manufacturing

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE3141](#) Information and networks
- [TRC3000](#) Automation project
- [TRC4200](#) Engineering cyber-physical systems
- [TRC4902](#) Mechatronics and manufacturing

Sustainable engineering

PREREQUISITES TO UNDERTAKE THE MINOR
[ENG2005](#). If you plan to take [CHE3163](#) in the minor, you must also have completed [CHE2162](#) prior

You must complete four units (24 cp) from below

- [CHE3163](#) Sustainable processing 1 or [ENE3031](#) Building sustainability
- [MTE4593](#) Materials and sustainability
- [ENE4042](#) Environmental impact and risk assessment
- [CIV4268](#) Water resources management or [CHE4173](#) Sustainable processing 2

Resources and renewable energy engineering specialisation

Available minors

The Renewable energy engineering minor is not available within the Resources and renewable energy engineering specialisation.

[Artificial intelligence in engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

[Civil engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must select and complete four units (24 cp) from below

- [CIV2282](#) Transport and traffic engineering
- [CIV2235](#) Structural materials
- [CIV3285](#) Engineering hydrology
- [CIV3247](#) Geomechanics 2

[Computational engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#)))

You must complete the four units (24 cp) below

- [ECE3093](#) Optimisation estimation and numerical methods
- [FIT3179](#) Data visualisation
- [MEC4447](#) Computers in fluids and energy
- [MTE4590](#) Modelling of materials

[Environmental engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must select and complete four units (24 cp) from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [ENE3032](#) Fate and transport of contaminants
- [ENE3606](#) The air environment
- [ENE4041](#) Soil remediation and solid waste management
- [ENE4042](#) Environmental impact and risk assessment

[Mining engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3020](#) Resource estimation
- [RSE3040](#) Mining systems
- [RSE4010](#) Mine planning and scheduling
- [RSE3030](#) Ventilation for surface and underground spaces

[Micro and nano technologies](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + [CHM1011](#))

You must complete the four units (24 cp) below

- [MEC3010](#) Micro and nanotechnologies: Fabrication and applications
- [CHE3172](#) Nanotechnology and materials 1
- [MTE4597](#) Engineering with nanomaterials
- [CHE4172](#) Nanotechnology and materials 2

[Smart manufacturing](#)

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE3141](#) Information and networks
- [TRC3000](#) Automation project
- [TRC4200](#) Engineering cyber-physical systems
- [TRC4902](#) Mechatronics and manufacturing

[Sustainable engineering](#)

PREREQUISITES TO UNDERTAKE THE MINOR
[ENG2005](#). If you plan to take [CHE3163](#) in the minor, you must also have completed [CHE2162](#) prior

You must complete four units (24 cp) from below

- [CHE3163](#) Sustainable processing 1 or [ENE3031](#) Building sustainability
- [MTE4593](#) Materials and sustainability
- [ENE4042](#) Environmental impact and risk assessment
- [CIV4268](#) Water resources management or [CHE4173](#) Sustainable processing 2

Robotics and mechatronics engineering specialisation

Available minors

The Environmental engineering and Civil engineering minors are not available within the Robotics and mechatronics engineering specialisation. Minors are available in Clayton only.

Artificial intelligence in engineering *Available to **Automation stream** only

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [CIV4100](#) Autonomous vehicle systems
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#)))

You must complete the four units (24 cp) below

- [ECE3093](#) Optimisation estimation and numerical methods
- [FIT3179](#) Data visualisation
- [MEC4447](#) Computers in fluids and energy
- [MTE4590](#) Modelling of materials

Micro and nano technologies

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#) + [CHM1011](#))

You must complete the four units (24 cp) below

- [MEC3010](#) Micro and nanotechnologies: Fabrication and applications
- [CHE3172](#) Nanotechnology and materials 1
- [MTE4597](#) Engineering with nanomaterials
- [CHE4172](#) Nanotechnology and materials 2

Mining engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3020](#) Resource estimation
- [RSE3040](#) Mining systems
- [RSE4010](#) Mine planning and scheduling
- [RSE3030](#) Ventilation for surface and underground spaces

Renewable energy engineering

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points, including [ENG2005](#) + ([MAE2404](#) or [MEC2404](#) or [CHE2161](#) or [CIV2263](#) or [TRC4802](#))

You must complete the four units (24 cp) below

- [RSE3141](#) Solar energy
- [RSE3241](#) Hydropower
- [RSE3242](#) Geothermal energy
- [RSE3243](#) Bioenergy

Smart manufacturing *Available to **Artificial intelligence stream** only

PREREQUISITES TO UNDERTAKE THE MINOR
96 credit points (including [ENG2005](#))

You must complete the four units (24 cp) below

- [ECE3141](#) Information and networks
- [TRC3000](#) Automation project
- [TRC4200](#) Engineering cyber-physical systems
- [TRC4902](#) Mechatronics and manufacturing

Sustainable engineering

PREREQUISITES TO UNDERTAKE THE MINOR
[ENG2005](#). If you plan to take [CHE3163](#) in the minor, you must also have completed [CHE2162](#) prior

You must complete four units (24 cp) from below

- [CHE3163](#) Sustainable processing 1 or [ENE3031](#) Building sustainability
- [MTE4593](#) Materials and sustainability
- [ENE4042](#) Environmental impact and risk assessment
- [CIV4268](#) Water resources management or [CHE4173](#) Sustainable processing 2