

Bachelor of Engineering (Honours)

Aerospace engineering specialisation

Available minors in Clayton

Update version: 31 October 2022

The environmental engineering and the civil engineering minors are not available within the aerospace engineering specialisation.

Artificial intelligence in engineering

You must complete four units (24 cp) selected from below

- [CIV4100](#) Autonomous vehicle systems
- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

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

Engineering entrepreneurship

You must complete the four units (24 cp) below

- [BEX3311](#) Entrepreneurial mindsets and capabilities
- [BEX3411](#) Building start-ups with impact
- [ENG3701](#) Entrepreneurial project A (Unit available from 2024)
- [ENG3702](#) Entrepreneurial project B (Unit available from 2024)

Micro and nano technologies

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

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

You must complete the four units (24 cp) below

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

Smart manufacturing

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

You must complete four units (24 cp) selected from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [CIV4268](#) Water resources management
- [ENE4042](#) Environmental impact and risk assessment
- [MTE4593](#) Materials and sustainability

Bachelor of Engineering (Honours)

Chemical engineering specialisation

Available minors in Clayton

Update version: 31 October 2022

The civil engineering and the engineering entrepreneurship minors are not available within the chemical engineering specialisation.

Artificial intelligence in engineering

You must complete four units (24 cp) selected from below

- [CIV4100](#) Autonomous vehicle systems
- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

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

You must complete four units (24 cp) selected from below

- [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

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

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

You must complete the four units (24 cp) below

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

Smart manufacturing

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

You must complete four units (24 cp)

- [CHE3163](#) Sustainable processing 1 (Core unit)
- [CHE4173](#) Sustainable processing 2 (Core unit)

and two units from the following

- [RSE3243](#) Bioenergy
- [ENE4042](#) Environmental impact and risk assessment
- [MTE4593](#) Materials and sustainability

Bachelor of Engineering (Honours)

Civil engineering specialisation

Available minors in Clayton

Update version: 31 October 2022

Artificial intelligence in engineering

You must complete four units (24 cp) selected from below

- [CIV4100](#) Autonomous vehicle systems
- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

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

Engineering entrepreneurship

You must complete the four units (24 cp) below

- [BEX3311](#) Entrepreneurial mindsets and capabilities
- [BEX3411](#) Building start-ups with impact
- [ENG3701](#) Entrepreneurial project A (Unit available from 2024)
- [ENG3702](#) Entrepreneurial project B (Unit available from 2024)

Environmental engineering

You must complete four units (24 cp) selected 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

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

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

You must complete the four units (24 cp) below

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

Smart manufacturing

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

You must complete four units (24 cp) selected from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [CIV4268](#) Water resources management
- [ENE4042](#) Environmental impact and risk assessment
- [MTE4593](#) Materials and sustainability

Bachelor of Engineering (Honours) Electrical and computer systems engineering specialisation

Available minors in Clayton

Update version: 31 October 2022

The environmental engineering and the civil engineering minors are not available within the electrical and computer systems engineering specialisation.

Artificial intelligence in engineering

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

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

Engineering entrepreneurship

You must complete the four units (24 cp) below

- [BEX3311](#) Entrepreneurial mindsets and capabilities
- [BEX3411](#) Building start-ups with impact
- [ENG3701](#) Entrepreneurial project A *(Unit available from 2024)*
- [ENG3702](#) Entrepreneurial project B *(Unit available from 2024)*

Micro and nano technologies

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

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

You must complete the four units (24 cp) below

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

Smart manufacturing

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

You must complete four units (24 cp) selected from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [CIV4268](#) Water resources management
- [ENE4042](#) Environmental impact and risk assessment
- [MTE4593](#) Materials and sustainability

Bachelor of Engineering (Honours) Environmental engineering specialisation

Available minors in Clayton

Update version: 31 October 2022

The sustainable engineering minor is not available within the environmental engineering specialisation.

Artificial intelligence in engineering

You must complete four units (24 cp) selected from below

- [CIV4100](#) Autonomous vehicle systems
- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Civil engineering

You must complete the four units (24 cp) below

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

Computational engineering

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

Engineering entrepreneurship

You must complete the four units (24 cp) below

- [BEX3311](#) Entrepreneurial mindsets and capabilities
- [BEX3411](#) Building start-ups with impacts
- [ENG3701](#) Entrepreneurial project A *(Unit available from 2024)*
- [ENG3702](#) Entrepreneurial project B *(Unit available from 2024)*

Micro and nano technologies

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

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

You must complete the four units (24 cp) below

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

Smart manufacturing

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

Bachelor of Engineering (Honours)

Materials engineering specialisation

Available minors in Clayton

Update version: 31 October 2022

The environmental engineering and the civil engineering minors are not available within the materials engineering specialisation.

Artificial intelligence in engineering

You must complete four units (24 cp) selected from below

- [CIV4100](#) Autonomous vehicle systems
- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

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

Engineering entrepreneurship

You must complete the four units (24 cp) below

- [BEX3311](#) Entrepreneurial mindsets and capabilities
- [BEX3411](#) Building start-ups with impact
- [ENG3701](#) Entrepreneurial project A *(Unit available from 2024)*
- [ENG3702](#) Entrepreneurial project B *(Unit available from 2024)*

Micro and nano technologies

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

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

You must complete the four units (24 cp) below

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

Smart manufacturing

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

You must complete four units (24 cp) selected from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [CIV4268](#) Water resources management
- [ENE4042](#) Environmental impact and risk assessment
- [MTE4593](#) Materials and sustainability

Bachelor of Engineering (Honours)

Mechanical engineering specialisation

Available minors in Clayton

Update version: 31 October 2022

The environmental engineering and the civil engineering minors are not available within the mechanical engineering specialisation.

Artificial intelligence in engineering

You must complete four units (24 cp) selected from below

- [CIV4100](#) Autonomous vehicle systems
- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Computational engineering

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

Engineering entrepreneurship

You must complete the four units (24 cp) below

- [BEX3311](#) Entrepreneurial mindsets and capabilities
- [BEX3411](#) Building start-ups with impact
- [ENG3701](#) Entrepreneurial project A (Unit available from 2024)
- [ENG3702](#) Entrepreneurial project B (Unit available from 2024)

Micro and nano technologies

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

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

You must complete the four units (24 cp) below

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

Smart manufacturing

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

You must complete four units (24 cp) selected from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [CIV4268](#) Water resources management
- [ENE4042](#) Environmental impact and risk assessment
- [MTE4593](#) Materials and sustainability

Bachelor of Engineering (Honours) Resources and mining engineering specialisation

Available minors in Clayton

Update version: 31 October 2022

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

Artificial intelligence in engineering

You must complete four units (24 cp) selected from below

- [CIV4100](#) Autonomous vehicle systems
- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Civil engineering

You must complete the four units (24 cp) from below

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

Computational engineering

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

Engineering entrepreneurship

You must complete the four units (24 cp) below

- [BEX3311](#) Entrepreneurial mindsets and capabilities
- [BEX3411](#) Building start-ups with impact
- [ENG3701](#) Entrepreneurial project A *(Unit available from 2024)*
- [ENG3702](#) Entrepreneurial project B *(Unit available from 2024)*

Environmental engineering

You must complete four units (24 cp) selected 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

Micro and nano technologies

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

You must complete the four units (24 cp) below

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

Smart manufacturing

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

You must complete four units (24 cp) selected from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [CIV4268](#) Water resources management
- [ENE4042](#) Environmental impact and risk assessment
- [MTE4593](#) Materials and sustainability

Bachelor of Engineering (Honours) Resources and renewable energy engineering specialisation

Available minors in Clayton

Update version: 31 October 2022

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

Artificial intelligence in engineering

You must complete four units (24 cp) selected from below

- [CIV4100](#) Autonomous vehicle systems
- [ECE2071](#) Computer organisation and programming
- [ECE4179](#) Neural networks and deep learning
- [ECE4076](#) Computer vision
- [ECE4078](#) Intelligent robotics

Civil engineering

You must complete the four units (24 cp) below

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

Computational engineering

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

Engineering entrepreneurship

You must complete the four units (24 cp) below

- [BEX3311](#) Entrepreneurial mindsets and capabilities
- [BEX3411](#) Building start-ups with impact
- [ENG3701](#) Entrepreneurial project A *(Unit available from 2024)*
- [ENG3702](#) Entrepreneurial project B *(Unit available from 2024)*

Environmental engineering

You must complete four units (24 cp) selected 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

Mining engineering

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

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

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

You must complete four units (24 cp) selected from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [CIV4268](#) Water resources management
- [ENE4042](#) Environmental impact and risk assessment
- [MTE4593](#) Materials and sustainability

Bachelor of Engineering (Honours)

Robotics and mechatronics engineering specialisation

Available minors in Clayton

Update version: 31 October 2022

The environmental engineering and the civil engineering minors are not available within the robotics and mechatronics engineering specialisation.

Artificial intelligence in engineering

*This minor is available to the **Automation stream** only*

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

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

Engineering entrepreneurship

You must complete the four units (24 cp) below

- [BEX3311](#) Entrepreneurial mindsets and capabilities
- [BEX3411](#) Building start-ups with impact
- [ENG3701](#) Entrepreneurial project A *(Unit available from 2024)*
- [ENG3702](#) Entrepreneurial project B *(Unit available from 2024)*

Micro and nano technologies

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

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

You must complete the four units (24 cp) below

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

Smart manufacturing

*This minor is available to the **Artificial intelligence stream** only*

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

You must complete four units (24 cp) selected from below

- [ENE2021](#) Energy and the environment
- [ENE3031](#) Building sustainability
- [CIV4268](#) Water resources management
- [ENE4042](#) Environmental impact and risk assessment
- [MTE4593](#) Materials and sustainability

Bachelor of Engineering (Honours)

2023 Technical electives in Clayton

Update version: 6 April 2023

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

First Year technical				
	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 ²	●		
¹ Biomedical engineering specialisation: If you are planning to specialise in Biomedical engineering, you must complete BMS1021 as a First Year elective unit. ² NOTE: If you complete a First Year technical elective that is also a core unit in your chosen specialisation or if you have completed a unit that is a prohibition to a core unit in your specialisation, you must replace the core with another unit chosen from your specialisation technical electives list or from one of the engineering minors. The replacement unit must be at the same level as the core unit or higher. Please seek advice from the Faculty of Engineering prior to enrolling in the replacement unit.	ENE1621 Environmental engineering	●		
	ENG1021 Spatial communication in engineering		●	
	ENG1051 Materials for energy and sustainability		●	
	MAT1830 Discrete mathematics for computer science ²	●		
	FIT1056 Collaborative engineering for web applications		●	
	PHS1002 Physics for engineering		●	
	RSE1010 Introduction to resources engineering		●	
	ECE2072 Digital systems ²		●	
	FIT2085 Introduction to computer science for engineers ²	●	●	
	MAE2505 Aerospace dynamics ²		●	
	MEC2404 Mechanics of fluids ²		●	
	TRC2001 Introduction to systems engineering			×

Aerospace engineering				
	MAE3406 Aerospace materials		●	
	MEC3010 Micro and nanotechnologies: Fabrication and applications	●		
	MEC3416 Machine design		●	
	MEC3459 Materials selection for engineering design		●	
	TRC3000 Automation project		●	
	TRC3500 Sensors and artificial perception	●		
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.	ECE4078 Intelligent robotics		●	
	MEC4407 Design project		●	
	MEC4428 Advanced dynamics			×
	MEC4447 Computers in fluids and energy	●		
	MEC4459 Wind engineering			×
	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			●
	You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.			

Chemical engineering			
	CHE2166 Introduction to process simulation		×
	CHE2167 Process material selection	×	
	CHM2951 Environmental chemistry – Water	●	

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

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.

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		●
CHM3960	Environmental chemistry	●	
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 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		●
<i>You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.</i>			

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 (<i>Available elective to students who commenced Civil Engineering before 2020</i>)		●
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		×
CIV4284	Sustainable traffic systems	×	
CIV4293	Transport planning for Asian cities		×
CIV5301	Advanced traffic engineering ¹		×

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

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	●	
<i>You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.</i>			

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.

TRC2001	Introduction to systems engineering		×
ECE3093	Optimisation estimation and numerical methods	●	
RSE3141	Solar energy	●	
TRC3500	Sensors and artificial perception	●	
ECE4024	Wireless communications		×
ECE4042	Communications theory	●	
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		●
ENG4700	Engineering technology for biomedical imaging and sensing	×	
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		●
ECE5886	Smart grids ¹		●
MEC5885	Energy efficiency and sustainability engineering ¹	●	
<i>You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.</i>			

Environmental engineering

ATS2548	Climate and environmental policy and management		●
BIO2011	Ecology and biodiversity	●	

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

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

BIO2040	Conservation biology		●
CIV2242	Geomechanics 1		●
CIV2282	Transport and traffic engineering	●	
BTX3100	Sustainability regulation for business <i>(Available elective to students who commenced Environmental Engineering before 2020)</i>	●	
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		●
CIV4248	Ground hazards engineering	×	
CIV4249	Foundation engineering		●
CIV4261	Integrated urban water management	×	
CIV4268	Water resources management		●
CIV4283	Transport planning		×
CIV4284	Sustainable traffic systems	×	
CIV4288	Water treatment		●
MTE4593	Materials and sustainability		●
<i>You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.</i>			

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	●	●
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	●	
<i>You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.</i>			

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

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		●
TRC2001	Introduction to systems engineering		×
MEC3010	Micro and nanotechnologies: Fabrication and applications	●	
MEC3448	Engineering technologies		×
MEC3459	Materials selection for engineering design		●
MEC3602	Biomedical microsystems		●
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	×	
MEC4418	Control systems	×	
MEC4425	Micro/nano solid and fluid mechanics		×
MEC4428	Advanced dynamics		×
MEC4444	Introduction to engineering acoustics		×
MEC4446	Composite structures	●	
MEC4447	Computers in fluids and energy	●	
MEC4459	Wind engineering		×
TRC4200	Engineering cyber-physical systems	●	
TRC4800	Robotics	●	
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		●
MEC5891	Design for additive manufacturing ¹	×	
MEC5897	Lean manufacturing ¹		●
<i>You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.</i>			

Resources and mining engineering

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

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

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

CIV4288 Water treatment		●
CIV4249 Foundation engineering		●
MTE4593 Materials and sustainability		●
<i>You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.</i>		

Resources and renewable energy engineering

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

ATS2548 Climate and environmental policy and management		●
CHE2163 Heat and mass transfer		●
EAE2522 Earth surface dynamics	●	
ENE2021 Energy and the environment	●	
MEC2405 Thermodynamics		●
CIV3247 Geomechanics 2		●
CIV3248 Groundwater and environmental geomechanics	●	
ENE3031 Building sustainability		●
ENE3032 Fate and transport of contaminants		●
ENE3606 The air environment		●
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	●	
<i>You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.</i>		

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		●
MAE2505 Aerospace dynamics		●
TRC2001 Introduction to systems engineering		×
ECE3051 Electrical energy systems	●	
ECE3073 Computer systems	●	
ECE3141 Information and networks	●	
MEC3010 Micro and nanotechnologies: Fabrication and applications	●	
MEC3416 Machine design		●
MEC3448 Engineering technologies		×
MEC3459 Materials selection for engineering 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		●

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

ENG4700	Engineering technology for biomedical imaging and sensing	×	
MEC4425	Micro/nano solid and fluid mechanics		×
MEC4426	Computer-aided design		●
MEC4428	Advanced dynamics		×
MEC4444	Introduction to engineering acoustics		×
MEC4446	Composite structures	●	
TRC4200	Engineering cyber-physical systems	●	
TRC4802	Thermo-fluids and power systems		●
TRC4902	Mechatronics and manufacturing		●
ECE5881	Real time system design ¹	●	
ECE5882	Advanced electronics design ¹		●
ECE5883	Advanced signal processing ¹	●	
ECE5884	Wireless communications ¹		●
ECE5886	Smart grids 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		●
MEC5891	Design for additive manufacturing ¹	×	
<i>You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules.</i>			

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		●
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		●
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	iOS app development	●	
FIT3179	Data visualisation		●
FIT3182	Big data management and processing	●	
FIT4005	IT research methods	●	●
FIT5003	Software security		●
FIT5032	Internet applications development		●

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

FIT5037	Network security		●
FIT5042	Enterprise application development on the web		×
FIT5046	Mobile and distributed computing systems	●	
FIT5124	Emerging topics for cybersecurity in practice	●	
FIT5129	Enterprise IT security: Planning, operations and management	●	
FIT5133	Enterprise architecture and management		×
FIT5137	Advanced database technology		●
FIT5140	IoT and mobile applications		×
FIT5145	Introduction to data science	●	●
FIT5163	Information and computer security	●	●
FIT5201	Machine learning	●	●
FIT5202	Data processing for big data		●
FIT5214	Blockchain		●
FIT5215	Deep learning		●
FIT5216	Modelling discrete optimisation problems	●	
FIT5217	Natural language processing	●	
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	●	
<i>You may consider an engineering technical unit chosen from the engineering minors, subject to meeting the unit prerequisite and/or co-requisite rules or with permission from the Faculty of Engineering.</i>			