

CHECKLIST Bachelor of Engineering (Honours) – Mechanical Engineering (2455): Transition to new program (Commencing 2024)

Important Notes:

- The information contained in this document is intended as general advice only. Students must follow the program rules & requirements listed on the [Programs and Courses Website](#) relevant to the year they commence. This planner must be used in conjunction with your program duration course list and program rules.
- Students need to check future course offerings, prerequisites, incompatibilities and restrictions for all courses as these are subject to change.
- Students cannot take courses that are incompatible with courses already counted towards their program, and cannot count the same course twice.

Complete 64 units comprising -

- I. 8 units for all [BE\(Hons\) Core Courses](#); and
- II. 36 units for one [Specialisation in Mechanical Engineering](#); and
- III. One of the following:
 - a. 16 units for one Major from Mechanical Engineering Major Options*, or
*Majors available in: [Aerospace Engineering](#); [Biomedical Engineering](#); [Materials Engineering](#); [Mining Engineering](#)
 - b. 16 units for Mechanical Engineering Minor Options**, or
**Minors available in: [Computing](#); [Data Science](#); [Design](#)
 - c. 16 units for [Mechanical Engineering Specialisation No Major option](#), and
- IV. 0 to 4 units from Preparatory Science and Mathematics Courses; and
- V. 0 to 4 units from First Year Engineering Elective Courses; and
- VI. 0 to 4 units from BE(Hons) Program Elective Course; and
- VII. 0 to 4 units from General Elective Courses.

NB: Of the 64 units required for the program, students must complete at least 24 units of courses at level 3 or higher and no more than 24 units at level 1.

✓/X compl.	BE(Hons) Core Courses (8 units)	Sem offering	#	First offered	Approved substitution	Last offered
	8 units for all Core Courses					
	ENGG1100 Professional Engineering	1,2	2		Course must be completed [ENGG1211 (4 units) will count as 2 units towards Part A in lieu of ENGG1100, and 2 units towards program electives]	
	ENGG1001 Programming for Engineers (NEW) or CSSE1001 Introduction to Software Engineering	1,2	2		Course must be completed	
	MATH1051 Calculus & Linear Algebra I or MATH1071 Advanced Calculus & Linear Algebra I	1,2	2		Course must be completed	
	MATH1052 Multivariate Calculus & Ordinary Differential Equations or MATH1072 Advanced Multivariate Calculus & Ordinary Differential Equations	1,2	2		Course must be completed	

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Specialisation in Mechanical Engineering

Complete 36 units comprising:

- i. 32 units for all [Mechanical Engineering Compulsory Courses](#), and
- ii. 4 units from [Mechanical Engineering Research Course](#)

✓/X compl.	Specialisation in Mechanical Engineering (36 units)	Sem offering	#	First offered	Approved substitution	Last offered
32 units for all Compulsory Courses						
	ENGG1300 Introduction to Electrical Systems	1,2	2		Course must be completed	
	ENGG1500 Thermodynamics: Energy and the Environment	1,2	2		ENGG1500 Engineering Thermodynamics	
	ENGG1700 Statics & Materials	1,2	2		ENGG1400 Engineering Mechanics: Statics & Dynamics (discontinued)	2/20
	MECH2100 Machine Element Design	2	2		Course must be completed	
	MECH2210 Intermediate Mechanical and Space Dynamics	2	2		Course must be completed	
	MECH2300 Structures and Materials	1	2		Course must be completed	
	MECH2305 Introduction to Engineering Design and Manufacturing	1	2		Course must be completed	
	MECH2410 Fundamentals of Fluid Mechanics	1	2		Course must be completed	
	MATH2001 Calculus & Linear Algebra II	1,2	2		MATH2001 Advanced Calculus & Linear Algebra II MATH2000 Calculus & Linear Algebra II	
	MATH2010 Analysis of Ordinary Differential Equations	1,2	1		Course must be completed	
	STAT2201 Analysis of Engineering & Scientific Data	1,2	1		Course must be completed	
	MECH3100 Systems Engineering Practice	2	2		Course must be completed	
	MECH3200 Advanced Dynamics and Vibrations	2	2		Course must be completed	
	MECH3400 Thermodynamics and Heat Transfer	1	2		Course must be completed	
	MECH3610 Systems Engineering Principles	1	2		MECH3600 Engineering Management & Communication (discontinued)	1/22
	ENGG4901 Professional Practice and the Business Environment A or ENGG4902 Professional Practice and the Business Environment B	1,2	2	1/24	ENGG4900 Professional Practice and the Business Environment (Discontinued)	2/23
	METR4201 Control Engineering I	1	2		Course must be completed	
4 units from Mechanical Engineering Research Course						
	ENGG4552 Major Design Project	1	4		No substitution	
	ENGG4600 Research Thesis	1	4		No substitution	
	ENGG4601 Engineering Thesis	2	4		No substitution	

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Mechanical Engineering No Major Option

Complete 16 units comprising -

1. 6 units for all [Mechanical Engineering Extension Courses](#); and
2. 4 to 10 units from [Mechanical Engineering Advanced Elective Courses](#); and
3. 0 to 6 units from [Mechanical Engineering Breadth Elective Courses](#); and
4. 0 to 4 units from [BE\(Hons\) Program Elective Courses](#); and
5. 0 to 4 units from [General Elective Courses](#).

✓/X compl.	Mechanical Engineering No Major (16 units)	Sem offering	#	First offered	Approved substitution	Last offered
6 units for all Mechanical Engineering Extension Courses						
	MECH2700 Computational Engineering & Data Analysis	2	2		Course must be completed	
	MECH3780 Computational Mechanics	1	2		MECH3300 Finite Element Method & Fracture Mechanics (discontinued)	1/22
	MECH3410 Fluid Mechanics	2	2		Course must be completed	

4 to 10 units from Mechanical Engineering Advanced Electives						
	AERO4300 Aerospace Composites	2	2		No substitution	
	AERO4450 Aerospace Propulsion	1	2		No substitution	
	AERO4470 Hypersonics	1	2		No substitution	
	AERO4800 Space Engineering	2	2		No substitution	
	ENGY4000 Energy Systems	1	2		No substitution	
	ENGG4103 Engineering Asset Management	1	2		No substitution	
	FIRE3700 Introduction to Fire Safety Engineering	1	2		No substitution	
	MATE4302 Electrochemistry and Corrosion	2	2		CHEE4302 Electrochemistry & Corrosion (discontinued)	2/20
	MECH3250 Engineering Acoustics	2	2		No substitution	
	MECH3301 Materials Selection	2	2		No substitution	
	MECH4304 Net Shape Manufacturing	1	2		No substitution	
	MECH4950 Advanced Manufacturing in Practice	2	2		No substitution	
	MECH4951 Special Topics D	1	1		No substitution	
	METR3100 Control System Implementation	1	2		No substitution	
	METR4202 Robotics & Automation	2	2		No substitution	

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	TIMS3309 Technology and Innovation Management	2	2		No substitution	
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0 to 6 units from Mechanical Engineering Breadth Electives						
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	ELEC2300 Fundamentals of Electromagnetism and Electromechanics	1	2		ELEC2003 Electromechanics & Electronics (discontinued).	1/21
	ENGG1600 Introduction to Research Practices - The Big Issues	2	2		No substitution	
	FIRE3700 Introduction to Fire Safety Engineering	1	2		No substitution	
	MECH2310 Science and Engineering of Metals	2	2		No substitution	
	PHYS2082 Space Science & Stellar Astrophysics	2	2		No substitution	
	<p>Mechanical Engineering Breadth Electives can also be chosen from course lists for the following majors:</p> <p>Aerospace Engineering</p> <p>Biomedical Engineering</p> <p>Materials Engineering</p> <p>Mining Engineering</p> <p><i>Courses on this list may require pre-requisites. Please seek academic advice if required.</i></p>					

0 to 4 units from BE(Hons) Program Elective Courses
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0 to 4 units from General Elective Courses.
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Aerospace Engineering Major Option

Complete 16 units comprising:

- i. 12 units for all [Aerospace Engineering Compulsory Courses](#), and
- ii. 4 units from [Aerospace Engineering Elective Courses](#)

✓/X compl.	Major in Aerospace Engineering (16 units)	Sem offering	#	First offered	Approved substitution	Last offered
12 units from Aerospace Engineering Compulsory Courses						
	MECH2700 Computational Engineering & Data Analysis	2	2		Course must be completed	
	MECH3780 Computational Mechanics	1	2		MECH3300 Finite Element Method & Fracture Mechanics (discontinued)	1/22
	MECH3410 Fluid Mechanics	2	2		Course must be completed	
	AERO4100 Aerospace Design & Manufacturing	2	2		Course must be completed	
	AERO4200 Flight Mechanics & Avionics	1	2		Course must be completed	
	AERO4450 Aerospace Propulsion	1	2		Course must be completed	

4 units from Aerospace Engineering Electives						
	AERO4300 Aerospace Composites	2	2		No substitution	
	AERO4470 Hypersonics	1	2		No substitution	
	AERO4800 Space Engineering	2	2		No substitution	

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Biomedical Engineering Major Option

Complete 16 units comprising:

- i. 4 units for all [Biomedical Engineering courses for Mechanical Engineers](#), and
- ii. 8 units for all [Biomedical Engineering Compulsory Courses](#), and
- iii. 4 units from [Biomedical Engineering Elective Courses](#)

✓/X compl.	Major in Biomedical Engineering (16 units)	Sem offering	#	First offered	Approved substitution	Last offered
4 units for Biomedical Engineering courses for Mechanical Engineers <u>only</u>						
	MECH2700 Computational Engineering & Data Analysis	2	2		Course must be completed	
	MECH3780 Computational Mechanics	1	2		MECH3300 Finite Element Method & Fracture Mechanics (discontinued)	1/22

8 units for Biomedical Engineering Compulsory Courses						
	BIOE1001 Principles of Biomedical & Bioprocess Engineering	1	2		CHEE1001 Principles of Biological Engineering (discontinued)	1/20
	BIOE3001 Quantitative Methods in Biomedical Engineering	2	2		Course must be completed	
	BIOE4305 Biomaterials: Materials in Medicine	2	2		CHEE4305 Biomaterials: Materials in Medicine (discontinued)	2/20
	BIOE6901 Medical Device Engineering	1	2		ELEC7901 Advanced Medical Device Engineering (discontinued)	1/20

4 units from Biomedical Engineering Electives						
	BIOC2000 Biochemistry & Molecular Biology	1	2		No substitution	
	BIOC2001 Foundations of Molecular Biophysics	1	2		No substitution	
	BIOE6028 Metabolic Engineering	2	2		CHEE4028 Metabolic Engineering (discontinued)	2/20
	BIOE6034 Cell and Tissue Engineering	1	2		No substitution	
	BIOE6403 Biomedical Instrumentation	2	2		ELEC4403/ELEC6403 Biomedical Instrumentation (discontinued)	2/20
	BIOE6601 Medical Imaging	2	2		ELEC6601 Medical Imaging (discontinued)	2/20
	BIOL1040 Cells to Organisms	1,2	2		No substitution	
	BIOL2200 Molecular Cell Biology I	1	2		No substitution	
	BIOL2202 Genetics	2	2		No substitution	

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	BIOM2011 Integrative Cell & Tissue Biology	1	2		No substitution	
	BIOM2012 Systems Physiology	2	2		No substitution	
	BIOM2020 Human Anatomy	1	2		No substitution	
	COMP3820 Digital Health Software Project	2	2		No substitution	
	COMP4702 Machine Learning	1	2		No substitution	
	COMS4113 Photonics	1	2		COMS4103 Photonics (discontinued)	1/20
	COMS4104 Microwave Engineering	1	2		No substitution	
	CSSE2002 Programming in the Large	1,2	2		No substitution	
	CSSE4011 Advanced Embedded Systems	1	2		No substitution	
	ELEC4620 Digital Signal Processing	2	2		No substitution	
	ELEC4630 Computer Vision and Deep Learning	1	2		No substitution	
	MATE6301 Nanomaterials	2	2		CHEE4301 Nanomaterials (discontinued)	2/20
	MECH3301 Materials Selection	2	2		No substitution	
	MECH4950 Advanced Manufacturing in Practice	2	2		No substitution	
	METR4202 Robotics & Automation	2	2		No substitution	
	MICR2000 Microbiology & Immunology	2	2		No substitution	
	SCIE2100 Bioinformatics 1: Introduction	1	2		No substitution	
	CHEE4026 Thesis Project or CHEE4027 Thesis Project	1 2	4		CHEE4006 Individual Inquiry or CHEE4007 Individual Inquiry (plus 2 units electives)	

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Materials Engineering Major Option

Complete 16 units comprising:

- i. 4 units for all [Materials Courses for Mechanical Engineers](#), and
- ii. 8 units for all [Materials Engineering Compulsory Courses](#), and
- iii. 4 units from [Materials Engineering Elective Courses](#)

✓/X compl.	Major in Materials Engineering (16 units)	Sem offering	#	First offered	Approved substitution	Last offered
4 units for Materials Engineering Courses for Mechanical Engineers <u>only</u>						
	MECH2700 Computational Engineering & Data Analysis	2	2		Course must be completed	
	MECH3780 Computational Mechanics	1	2		MECH3300 Finite Element Method & Fracture Mechanics (discontinued)	1/22

8 units for Materials Engineering Compulsory Courses						
	MECH2310 Science and Engineering of Metals	2	2		Course must be completed	
	CHEE3301 Polymer Engineering	1	2		Course must be completed	
	MECH3301 Materials Selection	2	2		Course must be completed	
	MATE4302 Electrochemistry and Corrosion	2	2		Course must be completed	

4 units from Materials Engineering Electives						
	AERO4300 Aerospace Composites	2	2		No substitution	
	BIOE4305 Biomaterials: Materials in Medicine	2	2		CHEE4305 Biomaterials: Materials in Medicine (discontinued)	2/20
	CHEE4006 Research Project	1	2		No substitution	
	CHEE4007 Research Project	2	2		No substitution	
	CHEE4026 Thesis Project or CHEE4027 Thesis Project	1 2	4		No substitution	
	MATE6301 Nanomaterials	2	2		CHEE4301 Nanomaterials (discontinued)	2/20
	MECH2305 Introduction to Engineering Design and Manufacturing	1	2		No substitution	
	MECH4304 Net Shape Manufacturing	1	2		No substitution	

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Mining Engineering Major Option

Complete 16 units comprising:

- i. 4 units for all [Mining Engineering Courses for Mechanical Engineers](#) and
- ii. 12 units for all [Mining Engineering Compulsory Courses](#)

✓/X compl.	Major in Mining Engineering (16 units)	Sem offering	#	First offered	Approved substitution	Last offered
4 units for Mining Engineering Courses for Mechanical Engineers <u>only</u>						
	MECH2700 Computational Engineering and Data Analysis	2	2		Course must be completed	
	MECH3780 Computational Mechanics	1	2		MECH3300 Finite Element Method & Fracture Mechanics (discontinued)	1/22

12 units for Mining Engineering Compulsory Courses						
	MINE3110 Integrated Orebody Knowledge	2	2		MINE3120 Resource Estimation (discontinued)	1/22
	MINE3122 Mining Systems & Automation	1	2		MINE3122 Mining Systems (renamed)	
	MINE3123 Mine Planning & Sustainability	2	2		MINE3123 Mine Planning	
	MINE3129 Applied Mining Geomechanics	1	2		MINE3121 Mining Geomechanics (discontinued)	1/22
	MINE4124 Mine Design and Feasibility	1	2		MINE4124 Hard Rock Mine Design & Feasibility	1/23
	MINE4129 Mine Process Optimisation	2	2		MINE3125 Explosives and Blasting Engineering (discontinued)	2/22

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Computing Minor Option

Complete 16 units comprising:

- i. 4 units for all [Computing Compulsory Courses](#), and
- ii. 4 units from [Computing Elective Courses](#), and
- iii. 6 units from [Mechanical Engineering Extension Courses](#), and
- iv. 2 units from [Mechanical Engineering Advanced Electives](#)

✓/X compl.	Minor in Computing (8 units)	Sem offering	#	First offered	Approved substitution	Last offered
4 units for all Computing Minor Compulsory Courses						
	CSSE2002 Programming in the Large	1,2	2		Course must be completed	
	COMP3506 Algorithms and Data Structures	2	2		Course must be completed	

4 units from Computing Electives						
	COMP4702 Machine Learning	1	2		No substitution	
	COSC2500 Numerical Methods in Computational Science	2	2		No substitution	
	COSC3000 Visualization, Computer Graphics & Data Analysis	1	2		No substitution	
	COSC3500 High Performance Computing	2	2		No substitution	
	INFS1200 Introduction to Information Systems	1,2	2		No substitution	
	INFS3208 Cloud Computing	2	2		No substitution	
	MATH3202 Operations Research & Mathematical Planning	1	2		No substitution	

6 units from Mechanical Engineering Extension Courses ,						
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2 units from Mechanical Engineering Advanced Electives						
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Data Science Minor Option

Complete 16 units comprising:

- i. 4 units for all [Data Science Compulsory Courses](#), and
- ii. 4 units from [Data Science Elective Courses](#), and
- iii. 6 units from [Mechanical Engineering Extension Courses](#), and
- iv. 2 units from [Mechanical Engineering Advanced Electives](#)

✓/X compl.	Minor in Data Science (8 units)	Sem offering	#	First offered	Approved substitution	Last offered
	4 units for all Data Science Minor Compulsory Courses					
	DATA2001 Fundamentals to Data Science	2	2		Course must be completed	
	INFS1200 Introduction to Information Systems	1,2	2		Course must be completed	

	4 units from Data Science Electives					
	COMP4702 Machine Learning	1	2		No substitution	
	INFS2200 Relational Database Systems	2	2		No substitution	
	INFS3208 Cloud Computing	2	2		No substitution	
	INFS4203 Data Mining	2	2		No substitution	
	STAT2003 Mathematical Probability	1	2		No substitution	
	STAT2004 Statistical Modelling & Analysis	2	2		No substitution	

6 units from [Mechanical Engineering Extension Courses](#),

2 units from [Mechanical Engineering Advanced Electives](#)

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Design Minor Option

Complete 16 units comprising:

- i. 8 units for all [Design Minor Compulsory Courses](#), and
- ii. 6 units from [Mechanical Engineering Extension Courses](#), and
- iii. 2 units from [Mechanical Engineering Advanced Electives](#)

✓/X compl.	Minor in Design (8 units)	Sem offering	#	First offered	Approved substitution	Last offered
8 units for all Design Electives						
	DSGN1100 Design: Interaction	1	2		No substitution	
	DSGN1200 Design: Experience	2	2		No substitution	
	DSGN2100 Design: Organisation	1	2		No substitution	
	DSGN2200 Design: Environment	2	2		No substitution	

6 units from [Mechanical Engineering Extension Courses](#),

2 units from [Mechanical Engineering Advanced Electives](#)

6 units for all Mechanical Engineering Extension Courses						
	MECH2700 Computational Engineering and Data Analysis	2	2		No substitution	
	MECH3410 Fluid Mechanics	2	2		No substitution	
	MECH3780 Computational Mechanics	1	2		No substitution	

2 units from Mechanical Engineering Advanced Elective Courses						
	AERO4300 Aerospace Composites	2	2		No substitution	
	AERO4450 Aerospace Propulsion	1	2		No substitution	
	AERO4470 Hypersonics	1	2		No substitution	
	AERO4800 Space Engineering	2	2		No substitution	
	ENGG4103 Engineering Asset Management	1	2		No substitution	
	ENGY4000 Energy Systems	1	2		No substitution	
	FIRE3700 Introduction to Fire Safety Engineering	1	2		No substitution	
	MATE4302 Electrochemistry and Corrosion	2	2		No substitution	
	MECH3250 Engineering Acoustics	2	2		No substitution	
	MECH4304 Net Shape Manufacturing	1	2		No substitution	
	MECH4950 Advanced Manufacturing in Practice	1,2,3	2		No substitution	
	METR3100 Control System Implementation	1	2		No substitution	
	METR4202 Robotics and Automation	2	2		No substitution	
	TIMS3309 Technology and Innovation Management	2	2		No substitution	

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