NUS Innovation & Design Programme
College of Design and Engineering

Bachelor of Engineering (Mechanical Engineering) with Minor in Innovation & Design

Cohort AY2024/2025

Course Requirements	Units
Common Curriculum	
GEA1000 Quantitative Reasoning with Data	4
CS1010E Programming Methodology	4
ES2631 Critique and Communication of Thinking and Design [1]	4
GEC: Cultures and Connections [1]	4
GEN: Communities and Engagement [1]	4
CDE2501 Liveable Cities [1, 2]	4
DTK1234 Design Thinking	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4
EG1311 Design and Make	4
PF1101 Fundamentals of Project Management or PF1101A Project Management and Finance	4
Additional technical courses for Engineering major [3]	12
ME4101A B.Eng. Dissertation (over 2 consecutive semesters) [4]	8
Sub-total for Common Curriculum	**60**
Engineering Core	
MA1505 Mathematics I	4
MA1512 Differential Equations for Engineering	2
MA1513 Linear Algebra with Differential Equations	2
EG2401A Engineering Professionalism	2
EG3611A Industrial Attachment or CFG2101 NUS Vacation Internship Programme [5] and EG3612 Vacation Industrial Attachment	10
Sub-total for Engineering Core	**20**
Engineering Programme Requirements	
ME1102 Engineering Principles and Practice I	4
ME2104 Engineering Principles and Practice II	4
ME2102 Engineering Innovation and Modelling	4
ME2112 Strength of Materials	4
ME2115/ME3115 Mechanics of Machines	4
ME2121 Engineering Thermodynamics and Heat Transfer	4
ME2134 Fluids Mechanics I	4
ME2142/ME3142 Feedback Control Systems	4
ME2162 Manufacturing Processes	4
Technical elective	4
Sub-total for Engineering Programme Requirements	**40**
Unrestricted Electives	
Group A course for Minor	4
Group B course for Minor	4
CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters)	12
Other unrestricted electives [4]	8
Sub-total for Unrestricted Electives	**40**
Total	**160**

(updated 16 June 2025)

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Notes:

[1] Students may read equivalent courses in NUS College (NUSC), University Town College Programme (UTCP), and Ridge View Residential Programme (RVRC).

[2] Students who are not in NUSC, UTCP or RVRC but have read another GESS Singapore Studies course prior to CDE2501 must still complete CDE2501.

[3] Students who have already read CDE2000 Creating Narratives and/or IE2141 Systems Thinking and Dynamics must still complete the 12 units of additional technical courses from their Engineering major.

The latest list of additional technical course may be found on this website: https://cde.nus.edu.sg/undergraduate/curriculum-structure/

Poly-intake students and those in the Engineering Scholars Programme only need to complete 8 units of additional technical course. The remaining 4 units may be fulfilled by CDE2501 (if not in NUSC/UTCP/RVRC and using another course to fulfil Singapore Studies), CDE2000, IE2141, or a third additional technical course.

[4] Students may take CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up in lieu of ME4101A and 4 units of unrestricted electives.

[5] May be replaced by CDE2605 Undergraduate Research Opportunities Programme or CDE2605R Undergraduate Research Experience (UREx).

(updated 16 June 2025)

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Recommended semester schedule – JC-intake students or equivalent

(for students who opt for vacation internships)

Semester 1	Units	Semester 2	Units
ME1102 Engineering Principles and Practice I	4	ME2104 Engineering Principles and Practice II	4
CS1010E Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
EG1311 Design and Make	4	DTK1234 Design Thinking	4
MA1505 Mathematics I	4	MA1512 Differential Equations for Engineering	2
GEC/GEN	4	MA1513 Linear Algebra with Differential Equations	2
		PF1101 Fundamentals of Project Management	4
		Group A/B course for Minor	4
Sub-total	**20**	**Sub-total**	**24**

Summer vacation between Semesters 2 and 3	Units
CFG2101 NUS Vacation Internship Programme	4
Sub-total	**4**

Semester 3	Units	Semester 4	Units
ME2102 Engineering Innovation and Modelling	4	ME2121 Engineering Thermodynamics and Heat Transfer	4
ME2112 Strength of Materials	4	CDE2501 Liveable Cities	4
ME2134 Fluids Mechanics I	4	EE2211 Introduction to Machine Learning	4
ES2631 Critique and Communication of Thinking and Design	4	Additional technical course 1	4
Group A/B course for Minor	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**20**	**Sub-total**	**22**

Summer vacation between Semesters 4 and 5	Units
EG3612 Vacation Internship Attachment	6
Sub-total	**6**

Semester 5	Units	Semester 6 – can be used for SEP	Units
CDE3301 Ideas to Proof-of-Concept	6	ME2115/ME3115 Mechanics of Machines	4
ME2162 Manufacturing Processes	4	EG2401A Engineering Professionalism	2
Additional technical course 2	4	UE	4
GEC/GEN	4	UE	4
		UE	4
Sub-total	**18**	**Sub-total**	**18**

Semester 7	Units	Semester 8	Units
ME4101A B.Eng. Dissertation	4	ME4101A B.Eng. Dissertation	4
ME2142/ME3142 Feedback Control Systems	4	Technical Elective	4
UE	4	Additional technical course 3	4
UE	4		
Sub-total	**16**	**Sub-total**	**12**

(updated 16 June 2025)

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Recommended semester schedule – JC-intake students or equivalent

(for students who opt for industrial attachment)

Semester 1	Units	Semester 2	Units
ME1102 Engineering Principles and Practice I	4	ME2104 Engineering Principles and Practice II	4
CS1010E Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
EG1311 Design and Make	4	DTK1234 Design Thinking	4
MA1505 Mathematics I	4	MA1512 Differential Equations for Engineering	2
GEC/GEN	4	MA1513 Linear Algebra with Differential Equations	2
		PF1101 Fundamentals of Project Management	4
		Group A/B course for Minor	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	Units	Semester 4	Units
ME2102 Engineering Innovation and Modelling	4	ME2121 Engineering Thermodynamics and Heat Transfer	4
ME2112 Strength of Materials	4	CDE2501 Liveable Cities	4
ME2134 Fluids Mechanics I	4	EE2211 Introduction to Machine Learning	4
ES2631 Critique and Communication of Thinking and Design	4	Additional technical course 1	4
Group A/B course for Minor	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**20**	**Sub-total**	**22**

Semester 5	Units	Semester 6	Units
CDE3301 Ideas to Proof-of-Concept	6	EG3611A Industrial Attachment	10
ME2115/ME3115 Mechanics of Machines	4		
ME2162 Manufacturing Processes	4		
EG2401A Engineering Professionalism	2		
Additional technical course 2	4		
GEC/GEN	4		
Sub-total	**24**	**Sub-total**	**10**

Semester 7	Units	Semester 8	Units
ME4101A B.Eng. Dissertation	4	ME4101A B.Eng. Dissertation	4
ME2142/ME3142 Feedback Control Systems	4	Technical Elective	4
UE	4	Additional technical course 3	4
UE	4	UE	4
UE	4	UE	4
Sub-total	**20**	**Sub-total**	**20**

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Recommended semester schedule – JC-intake students or equivalent

(for students in Engineering Scholars Programme)

Semester 1	Units	Semester 2	Units
ME1102 Engineering Principles and Practice I	4	ME2104 Engineering Principles and Practice II	4
ME2102 Engineering Innovation and Modelling	4	ME2134 Fluids Mechanics I	4
MA1512 Differential Equations for Engineering	2	GEA1000 Quantitative Reasoning with Data	4
MA1513 Linear Algebra with Differential Equations	2	DTK1234 Design Thinking	4
UTCP course 1 (replaces GE)	4	UTCP course 2 (replaces GE)	4
Group B course for Minor	4	CDE3301 Ideas to Proof-of-Concept	6
UE	4		
Sub-total	**24**	**Sub-total**	**26**

Semester 3	Units	Semester 4 – NOC	Units
ME2112 Strength of Materials	4	NOC	
ME2121 Engineering Thermodynamics and Heat Transfer	4		
ME2142/ME3142 Feedback Control Systems	4		
ME2162 Manufacturing Processes	4		
UTCP course 3 (replaces CDE2501)	4		
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	**26**	**Sub-total**	**20**

Semester 5	Units	Semester 6	Units
ME4101A B.Eng. Dissertation	4	ME4101A B.Eng. Dissertation	4
ME2115/ME3115 Mechanics of Machines	4	Additional technical course 2	4
Technical Elective	4	Additional technical course 3	4
UTCP course 4 (replaces ES2631 Critique and Communication of Thinking and Design)	4	EE2211 Introduction to Machine Learning	4
Additional technical course 1	4	PF1101A Project Management and Finance	4
Group A course for Minor	4	UE	4
UE	4		
Sub-total	**28**	**Sub-total**	**24**

Students must complete the following courses before Semester 1 through advanced placement credits:

- CS1010E Programming Methodology (4 units)
- EG1311 Design and Make (4 units)
- MA1505 Mathematics I (4 units)

A one-semester NOC programme comprises the following courses (up to 20 units):

- ETP3201S Innovation & Enterprise Internship (12 units) – replaces EG3611A (10 units) and EG2401A (2 units)
- ETP3204S Innovation & Enterprise Internship Practicum (4 units) – counted as UE (4 units)
- Entrepreneurship course (4 units) – counted as UE (4 units)

(updated 16 June 2025)

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Recommended semester schedule – poly-intake students

(for students who may want to upgrade to a Second Major)

Semester 1	Units	Semester 2	Units
ME1102 Engineering Principles and Practice I	4	ME2104 Engineering Principles and Practice II	4
ME2102 Engineering Innovation and Modelling	4	ME2112 Strength of Materials	4
CS1010E Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
MA1301 Introductory Mathematics * (UE)	4	MA1512 Differential Equations for Engineering	2
Group A/B course for Minor	4	MA1513 Linear Algebra with Differential Equations	2
		CDE3301 Ideas to Proof-of-Concept	6
		Group A/B course for Minor	4
Sub-total	**20**	**Sub-total**	**26**

Semester 3	Units	Semester 4	Units
MA1505 Mathematics I *	4	CDE2501 Liveable Cities	4
ME2115/ME3115 Mechanics of Machines	4	EE2211 Introduction to Machine Learning	4
ME2121 Engineering Thermodynamics and Heat Transfer	4	ME2134 Fluids Mechanics I	4
ME2162 Manufacturing Processes	4	EG2401A Engineering Professionalism	2
ES2631 Critique and Communication of Thinking and Design	4	PF1101A Project Management and Finance	4
CDE3301 Ideas to Proof-of-Concept	6	Additional technical course 1	4
Sub-total	**26**	**Sub-total**	**22**

Semester 5	Units	Semester 6	Units
ME4101A B.Eng. Dissertation	4	ME4101A B.Eng. Dissertation	4
ME2142/ME3142 Feedback Control Systems	4	Technical Elective	4
GEC/GEN	4	Additional technical course 2	4
GEC/GEN	4	Additional technical course 3	4
Sub-total	**16**	**Sub-total**	**16**

* Students who are exempted from MA1301 can take MA1505 in Semester 1.

Poly-intake students with accredited diplomas will receive the following exemptions:

- DTK1234 Design Thinking (4 units)
- EG1311 Design and Make (4 units)
- EG3611P Industrial Attachment (10 units)
- Unrestricted electives (20 units)

(updated 16 June 2025)

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Recommended semester schedule – poly-intake students

(for students who are not planning to upgrade to a Second Major)

Semester 1	Units	Semester 2	Units
ME1102 Engineering Principles and Practice I	4	ME2104 Engineering Principles and Practice II	4
ME2102 Engineering Innovation and Modelling	4	ME2112 Strength of Materials	4
CS1010E Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
MA1301 Introductory Mathematics * (UE)	4	MA1512 Differential Equations for Engineering	2
GEC/GEN	4	MA1513 Linear Algebra with Differential Equations	2
		GEC/GEN	4
		Group A/B course for Minor	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	Units	Semester 4	Units
MA1505 Mathematics I *	4	CDE2501 Liveable Cities	4
ME2115/ME3115 Mechanics of Machines	4	EE2211 Introduction to Machine Learning	4
ME2121 Engineering Thermodynamics and Heat Transfer	4	ME2134 Fluids Mechanics I	4
ME2162 Manufacturing Processes	4	EG2401A Engineering Professionalism	2
ES2631 Critique and Communication of Thinking and Design	4	PF1101A Project Management and Finance	4
Group A/B course for Minor	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**24**	**Sub-total**	**24**

Semester 5	Units	Semester 6	Units
ME4101A B.Eng. Dissertation	4	ME4101A B.Eng. Dissertation	4
ME2142/ME3142 Feedback Control Systems	4	Technical Elective	4
Additional technical course 1	4	Additional technical course 2	4
CDE3301 Ideas to Proof-of-Concept	6	Additional technical course 3	4
Sub-total	**18**	**Sub-total**	**16**

* Students who are exempted from MA1301 can take MA1505 in Semester 1.

Poly-intake students with accredited diplomas will receive the following exemptions:

- DTK1234 Design Thinking (4 units)
- EG1311 Design and Make (4 units)
- EG3611P Industrial Attachment (10 units)
- Unrestricted electives (20 units)

(updated 16 June 2025)