NUS Innovation & Design Programme
College of Design and Engineering

Bachelor of Engineering (Civil 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
CE4104 B.Eng. Dissertation [4]	8
Sub-total for Common Curriculum	**60**
Engineering Core	
MA1511 Engineering Calculus	2
MA1513 Linear Algebra with Differential Equations	2
CE2407A Uncertainty Analysis for Engineers	2
CE2407B Introduction to Numerical Methods for Engineers	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	
CE1103 Principles of Structural and Geotechnical Engineering	4
CE2155 Principles of Structural Mechanics and Materials	4
CE2134 Fluid Mechanics	4
CE3115 Stability of Slopes and Earth Retention Systems	4
CE3116 Foundation Systems for Urban Infrastructure	4
CE3121 Urban Transportation Engineering	4
CE3132 Hydrology and Free Surface Flows	4
CE3155A Structural Behaviour	2
CE3155B Structural Modelling	2
CE3165 Concrete Design for Urban Infrastructure	4
CE3166 Steel Design for Urban Infrastructure	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]	20
Sub-total for Unrestricted Electives	**40**
Total	**160**

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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 CE4104 and 4 units of unrestricted electives.

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

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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
CE1103 Principles of Structural and Geotechnical Engineering	4	CE2155 Principles of Structural Mechanics and Materials	4
GEA1000 Quantitative Reasoning with Data	4	CS1010E Programming Methodology	4
DTK1234 Design Thinking	4	EG1311 Design and Make	4
MA1513 Linear Algebra with Differential Equations	2	MA1511 Engineering Calculus	2
CE2407A Uncertainty Analysis for Engineers	2	CE2407B Introduction to Numerical Methods for Engineers	2
PF1101 Fundamentals of Project Management	4	Group A/B course for Minor	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
CE2134 Fluid Mechanics	4	CE3115 Stability of Slopes and Earth Retention Systems	4
CE3155A Structural Behaviour	2	ES2631 Critique and Communication of Thinking and Design	4
CE3155B Structural Modelling	2	GEC/GEN	4
CDE2501 Liveable Cities	4	GEC/GEN	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	CDE3301 Ideas to Proof-of-Concept	6
Group A/B course for Minor	4		
Sub-total	**20**	**Sub-total**	**22**

Summer vacation between Semesters 4 and 5	Units
CFG2101 NUS Vacation Internship Programme	4
Sub-total	**4**

Semester 5	Units	Semester 6 – can be used for SEP	Units
CDE3301 Ideas to Proof-of-Concept	6	CE3116 Foundation Systems for Urban Infrastructure	4
CE3121 Urban Transportation Engineering	4	CE3132 Hydrology and Free Surface Flows	4
CE3165 Concrete Design for Urban Infrastructure	4	CE3166 Steel Design for Urban Infrastructure	4
Additional technical course 1	4	Additional technical course 2	4
EG2401A Engineering Professionalism	2	UE	4
Sub-total	**20**	**Sub-total**	**20**

Summer vacation between Semesters 6 and 7	Units
EG3612 Vacation Internship Attachment	6
Sub-total	**6**

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Semester 7	Units	Semester 8	Units
CE4104 B.Eng. Dissertation	4	CE4104 B.Eng. Dissertation	4
Additional technical course 3	4	UE	4
UE	4	UE	4
UE	4		
Sub-total	**16**	**Sub-total**	**12**

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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
CE1103 Principles of Structural and Geotechnical Engineering	4	CE2155 Principles of Structural Mechanics and Materials	4
GEA1000 Quantitative Reasoning with Data	4	CS1010E Programming Methodology	4
DTK1234 Design Thinking	4	EG1311 Design and Make	4
MA1513 Linear Algebra with Differential Equations	2	MA1511 Engineering Calculus	2
CE2407A Uncertainty Analysis for Engineers	2	CE2407B Introduction to Numerical Methods for Engineers	2
PF1101 Fundamentals of Project Management	4	Group A/B course for Minor	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
CE2134 Fluid Mechanics	4	CE3115 Stability of Slopes and Earth Retention Systems	4
CE3155A Structural Behaviour	2	ES2631 Critique and Communication of Thinking and Design	4
CE3155B Structural Modelling	2	GEC/GEN	4
CDE2501 Liveable Cities	4	GEC/GEN	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	CDE3301 Ideas to Proof-of-Concept	6
Group A/B course for Minor	4		
Sub-total	**20**	**Sub-total**	**22**

Semester 5	Units	Semester 6	Units
CDE3301 Ideas to Proof-of-Concept	6	CE4104 B.Eng. Dissertation	4
CE3121 Urban Transportation Engineering	4	CE3116 Foundation Systems for Urban Infrastructure	4
CE3165 Concrete Design for Urban Infrastructure	4	CE3132 Hydrology and Free Surface Flows	4
Additional technical course 1	4	CE3166 Steel Design for Urban Infrastructure	4
EG2401A Engineering Professionalism	2	Additional technical course 2	4
UE	4	UE	4
Sub-total	**24**	**Sub-total**	**24**

Semester 7	Units	Semester 8	Units
CE4104 B.Eng. Dissertation	4	EG3611A Industrial Attachment	10
Additional technical course 3	4		
UE	4		
UE	4		
UE	4		
Sub-total	**20**	**Sub-total**	**10**

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Recommended semester schedule – JC-intake students or equivalent

(for students in Engineering Scholars Programme)

Semester 1	Units	Semester 2	Units
CE1103 Principles of Structural and Geotechnical Engineering	4	CE2155 Principles of Structural Mechanics and Materials	4
GEA1000 Quantitative Reasoning with Data	4	CE2407B Introduction to Numerical Methods for Engineers	2
DTK1234 Design Thinking	4	CE3115 Stability of Slopes and Earth Retention Systems	4
MA1513 Linear Algebra with Differential Equations	2	UTCP course 2 (replaces GE)	4
CE2407A Uncertainty Analysis for Engineers	2	CDE3301 Ideas to Proof-of-Concept	6
PF1101 Fundamentals of Project Management	4	Group A/B course for Minor	4
UTCP course 1 (replaces GE)	4	UE (or IE2141 Systems Thinking & Dynamics if not in RC4)	4
Sub-total	**24**	**Sub-total**	**28**

Semester 3	Units	Semester 4 – NOC	Units
CE2134 Fluid Mechanics	4	NOC	
CE3155A Structural Behaviour	2		
CE3155B Structural Modelling	2		
CE3121 Urban Transportation Engineering	4		
Additional technical course 1	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
CE4104 B.Eng. Dissertation	4	CE4104 B.Eng. Dissertation	4
Group A/B course for Minor	4	CE3116 Foundation Systems for Urban Infrastructure	4
UTCP course 4 (replaces ES2631 Critique and Communication of Thinking and Design)	4	CE3132 Hydrology and Free Surface Flows	4
Additional technical course 2	4	CE3166 Steel Design for Urban Infrastructure	4
CE3165 Concrete Design for Urban Infrastructure	4	UE	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	UE	4
UE	2		
Sub-total	**26**	**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) – replaces MA1511 Engineering Calculus (2 units) and counted as UE (2 units)

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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)

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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
CE1103 Principles of Structural and Geotechnical Engineering	4	CE2155 Principles of Structural Mechanics and Materials	4
GEA1000 Quantitative Reasoning with Data	4	CS1010E Programming Methodology	4
PF1101 Fundamentals of Project Management	4	MA1511 Engineering Calculus	2
MA1301 Introductory Mathematics * (UE)	4	CE2407B Introduction to Numerical Methods for Engineers	2
Group A/B course for Minor	4	CDE3301 Ideas to Proof-of-Concept	6
		Group A/B course for Minor	4
Sub-total	**20**	**Sub-total**	**22**

Semester 3	Units	Semester 4	Units
MA1513 Linear Algebra with Differential Equations *	2	CE3115 Stability of Slopes and Earth Retention Systems	4
CE2407A Uncertainty Analysis for Engineers *	2	ES2631 Critique and Communication of Thinking and Design	4
CE2134 Fluid Mechanics	4	Additional technical course 2	4
CE3155A Structural Behaviour	2	EE2211 Introduction to Machine Learning	4
CE3155B Structural Modelling	2	GEC/GEN	4
CDE2501 Liveable Cities	4	GEC/GEN	4
Additional technical course 1	4		
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	**26**	**Sub-total**	**24**

Semester 5	Units	Semester 6	Units
CE4104 B.Eng. Dissertation	4	CE4104 B.Eng. Dissertation	4
Additional technical course 3	4	CE3116 Foundation Systems for Urban Infrastructure	4
CE3121 Urban Transportation Engineering	4	CE3132 Hydrology and Free Surface Flows	4
CE3165 Concrete Design for Urban Infrastructure	4	CE3166 Steel Design for Urban Infrastructure	4
EG2401A Engineering Professionalism	2		
Sub-total	**18**	**Sub-total**	**16**

* Students who are exempted from MA1301 can take MA1513 and CE2407A 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)
- EG3611A Industrial Attachment (10 units)
- Unrestricted electives (20 units)

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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
CE1103 Principles of Structural and Geotechnical Engineering	4	CE2155 Principles of Structural Mechanics and Materials	4
GEA1000 Quantitative Reasoning with Data	4	CS1010E Programming Methodology	4
PF1101 Fundamentals of Project Management	4	MA1511 Engineering Calculus	2
MA1301 Introductory Mathematics * (UE)	4	CE2407B Introduction to Numerical Methods for Engineers	2
GEC/GEN	4	GEC/GEN	4
		Group A/B course for Minor	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
MA1513 Linear Algebra with Differential Equations *	2	CE3115 Stability of Slopes and Earth Retention Systems	4
CE2407A Uncertainty Analysis for Engineers *	2	ES2631 Critique and Communication of Thinking and Design	4
CE2134 Fluid Mechanics	4	EE2211 Introduction to Machine Learning	4
CE3155A Structural Behaviour	2	Additional technical course 2	4
CE3155B Structural Modelling	2	CDE3301 Ideas to Proof-of-Concept	6
Additional technical course 1	4		
Group A/B course for Minor	4		
Sub-total	**20**	**Sub-total**	**22**

Semester 5	Units	Semester 6	Units
CE4104 B.Eng. Dissertation	4	CE4104 B.Eng. Dissertation	4
CE3121 Urban Transportation Engineering	4	CE3116 Foundation Systems for Urban Infrastructure	4
CE3165 Concrete Design for Urban Infrastructure	4	CE3132 Hydrology and Free Surface Flows	4
Additional technical course 3	4	CE3166 Steel Design for Urban Infrastructure	4
EG2401A Engineering Professionalism	2	CDE2501 Liveable Cities	4
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	**24**	**Sub-total**	**20**

* Students who are exempted from MA1301 can take MA1513 and CE2407A 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)
- EG3611A Industrial Attachment (10 units)
- Unrestricted electives (20 units)

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