Innovation & Design Programme
NUS College of Design and Engineering

Bachelor of Engineering (Infrastructure & Project Management) with Second Major 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
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) [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	
IPM1102 Infrastructure and Project Management Law	4
IPM1103I Digitalisation in the Built Environment	4
IPM1104 Built Environment Engineering Principles and Practice	4
IPM2101 Introduction to Building Performance	4
IPM2102 Construction Technology	4
IPM2103 Measurement (Building Works)	4
IPM2104 Project Cost Management	4
IPM3102 Infrastructure and Facilities Management	4
IPM4102 Project Execution	4
IPM4103 Contract and Procurement Management	4
Sub-total for Engineering Programme Requirements	**40**
Unrestricted Electives	
Group A course for Second Major	4
Group B course for Second Major	4
Group C courses for Second Major (Innovation & Enterprise electives)	8
CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters)	12
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) [4]	4

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Other unrestricted electives	8
Sub-total for Unrestricted Electives	**40**
Total	**160**

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] The 12 units for CDE4301/CDE4301A are counted towards 8 units for the Integrated Project requirement in the Common Curriculum while 4 units are counted as unrestricted elective.

[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
IPM1102 Infrastructure and Project Management Law	4	IPM1103I Digitalisation in the Built Environment	4
IPM1104 Built Environment Engineering Principles and Practice	4	CS1010E Programming Methodology	4
GEA1000 Quantitative Reasoning with Data	4	EG1311 Design and Make	4
DTK1234 Design Thinking	4	MA1511 Engineering Calculus	2
MA1513 Linear Algebra with Differential Equations	2	CE2407B Introduction to Numerical Methods for Engineers	2
CE2407A Uncertainty Analysis for Engineers	2	Group A/B course for Second Major	4
Sub-total	**20**	**Sub-total**	**20**

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

Semester 3	Units	Semester 4	Units
IPM2101 Introduction to Building Performance	4	IPM2103 Measurement (Building Works)	4
IPM2102 Construction Technology	4	IPM2104 Project Cost Management	4
CDE2501 Liveable Cities	4	ES2631 Critique and Communication of Thinking and Design	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	GEC/GEN	4
PF1101A Project Management and Finance	4	CDE3301 Ideas to Proof-of-Concept	6
Group A/B course for Second Major	4		
Sub-total	**24**	**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	Innovation & Enterprise Elective 1	4
IPM3102 Infrastructure and Facilities Management	4	Innovation & Enterprise Elective 2	4
Additional technical course 1	4	Additional technical course 3	4
Additional technical course 2	4	GEC/GEN	4
EG2401A Engineering Professionalism	2	UE	4
Sub-total	**20**	**Sub-total**	**20**

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Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6	CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6
IPM4102 Project Execution	4	UE	4
IPM4103 Contract and Procurement Management	4		
Sub-total	**14**	**Sub-total**	**10**

(updated 16 July 2025)

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Recommended semester schedule – JC-intake students or equivalent
(for students who opt for vacation internships plus a specialisation)

Semester 1	Units	Semester 2	Units
IPM1102 Infrastructure and Project Management Law	4	IPM1103I Digitalisation in the Built Environment	4
IPM1104 Built Environment Engineering Principles and Practice	4	CS1010E Programming Methodology	4
GEA1000 Quantitative Reasoning with Data	4	EG1311 Design and Make	4
DTK1234 Design Thinking	4	MA1511 Engineering Calculus	2
MA1513 Linear Algebra with Differential Equations	2	CE2407B Introduction to Numerical Methods for Engineers	2
CE2407A Uncertainty Analysis for Engineers	2	Group A/B course for Second Major	4
Sub-total	**20**	**Sub-total**	**20**

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

Semester 3	Units	Semester 4	Units
IPM2101 Introduction to Building Performance	4	IPM2103 Measurement (Building Works)	4
IPM2102 Construction Technology	4	IPM2104 Project Cost Management	4
CDE2501 Liveable Cities	4	ES2631 Critique and Communication of Thinking and Design	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	GEC/GEN	4
PF1101A Project Management and Finance	4	CDE3301 Ideas to Proof-of-Concept	6
Group A/B course for Second Major	4		
Sub-total	**24**	**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	Innovation & Enterprise Elective 1	4
IPM3102 Infrastructure and Facilities Management	4	Innovation & Enterprise Elective 2	4
Additional technical course 1	4	Additional technical course 3	4
Additional technical course 2	4	GEC/GEN	4
EG2401A Engineering Professionalism	2	Specialisation course 2	4
Sub-total	**20**	**Sub-total**	**20**

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Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6	CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6
IPM4102 Project Execution	4	Specialisation course 4	4
IPM4103 Contract and Procurement Management	4	Specialisation course 5	4
Specialisation course 3	4		
Sub-total	**18**	**Sub-total**	**14**

Note: IPM1104 Built Environment Engineering Principles and Practice is double-counted as a course for the Specialisation in Sustainable Green Buildings.

(updated 16 July 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
IPM1102 Infrastructure and Project Management Law	4	IPM1103I Digitalisation in the Built Environment	4
IPM1104 Built Environment Engineering Principles and Practice	4	CS1010E Programming Methodology	4
GEA1000 Quantitative Reasoning with Data	4	EG1311 Design and Make	4
DTK1234 Design Thinking	4	MA1511 Engineering Calculus	2
MA1513 Linear Algebra with Differential Equations	2	CE2407B Introduction to Numerical Methods for Engineers	2
CE2407A Uncertainty Analysis for Engineers	2	Group A/B course for Second Major	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
IPM2101 Introduction to Building Performance	4	IPM2103 Measurement (Building Works)	4
IPM2102 Construction Technology	4	IPM2104 Project Cost Management	4
CDE2501 Liveable Cities	4	ES2631 Critique and Communication of Thinking and Design	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	GEC/GEN	4
PF1101A Project Management and Finance	4	CDE3301 Ideas to Proof-of-Concept	6
Group A/B course for Second Major	4		
Sub-total	**24**	**Sub-total**	**22**

Semester 5	Units	Semester 6	Units
CDE3301 Ideas to Proof-of-Concept	6	EG3611A Industrial Attachment	10
IPM3102 Infrastructure and Facilities Management	4		
Additional technical course 1	4		
Additional technical course 2	4		
EG2401A Engineering Professionalism	2		
Sub-total	**20**	**Sub-total**	**10**

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6	CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6
IPM4102 Project Execution	4	Innovation & Enterprise Elective 1	4
IPM4103 Contract and Procurement Management	4	Innovation & Enterprise Elective 2	4
GEC/GEN	4	Additional technical course 3	4
UE	4	UE	4
Sub-total	**22**	**Sub-total**	**22**

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Recommended semester schedule – JC-intake students or equivalent
(for students who opt for industrial attachment plus a specialisation)

Semester 1	Units	Semester 2	Units
IPM1102 Infrastructure and Project Management Law	4	IPM1103I Digitalisation in the Built Environment	4
IPM1104 Built Environment Engineering Principles and Practice	4	CS1010E Programming Methodology	4
GEA1000 Quantitative Reasoning with Data	4	EG1311 Design and Make	4
DTK1234 Design Thinking	4	MA1511 Engineering Calculus	2
MA1513 Linear Algebra with Differential Equations	2	CE2407B Introduction to Numerical Methods for Engineers	2
CE2407A Uncertainty Analysis for Engineers	2	Group A/B course for Second Major	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
IPM2101 Introduction to Building Performance	4	IPM2103 Measurement (Building Works)	4
IPM2102 Construction Technology	4	IPM2104 Project Cost Management	4
CDE2501 Liveable Cities	4	ES2631 Critique and Communication of Thinking and Design	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	GEC/GEN	4
PF1101A Project Management and Finance	4	GEC/GEN	4
Group A/B course for Second Major	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**24**	**Sub-total**	**26**

Semester 5	Units	Semester 6	Units
CDE3301 Ideas to Proof-of-Concept	6	EG3611A Industrial Attachment	10
IPM3102 Infrastructure and Facilities Management	4		
Additional technical course 1	4		
Additional technical course 2	4		
EG2401A Engineering Professionalism	2		
Specialisation course 2	4		
Sub-total	**24**	**Sub-total**	**10**

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6	CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6
IPM4102 Project Execution	4	Innovation & Enterprise Elective 1	4
IPM4103 Contract and Procurement Management	4	Innovation & Enterprise Elective 2	4
Specialisation course 3	4	Additional technical course 3	4
Specialisation course 4	4	Specialisation course 5	4
Sub-total	**22**	**Sub-total**	**22**

Note: IPM1104 Built Environment Engineering Principles and Practice is double-counted as a course for the Specialisation in Sustainable Green Buildings.

(updated 16 July 2025)

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Recommended semester schedule – JC-intake students or equivalent

(for students in year-long NOC programmes)

Semester 1	Units	Semester 2	Units
IPM1102 Infrastructure and Project Management Law	4	IPM1103I Digitalisation in the Built Environment	4
IPM1104 Built Environment Engineering Principles and Practice	4	CS1010E Programming Methodology	4
GEA1000 Quantitative Reasoning with Data	4	EG1311 Design and Make	4
DTK1234 Design Thinking	4	MA1511 Engineering Calculus	2
MA1513 Linear Algebra with Differential Equations	2	CE2407B Introduction to Numerical Methods for Engineers	2
CE2407A Uncertainty Analysis for Engineers	2	Group A/B course for Second Major	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
IPM2101 Introduction to Building Performance	4	IPM2103 Measurement (Building Works)	4
IPM2102 Construction Technology	4	IPM2104 Project Cost Management	4
CDE2501 Liveable Cities	4	ES2631 Critique and Communication of Thinking and Design	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	GEC/GEN	4
PF1101A Project Management and Finance	4	CDE3301 Ideas to Proof-of-Concept	6
Group A/B course for Second Major	4		
Sub-total	**24**	**Sub-total**	**22**

Semester 5	Units	Semester 6 – NOC	Units
CDE3301 Ideas to Proof-of-Concept	6	NOC	
IPM3102 Infrastructure and Facilities Management	4		
IPM4102 Project Execution	4		
IPM4103 Contract and Procurement Management	4		
Additional technical course 1	4		
Additional technical course 2	4		
Sub-total	**26**	**Sub-total**	**20**

Semester 7 – NOC	Units	Semester 8	Units
NOC		Additional technical course 3	4
		GEC/GEN	4
Sub-total	**20**	**Sub-total**	**8**

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A year-long NOC programme comprises the following courses (up to 40 units):

- ETP3206L Innovation & Enterprise Internship (16 units) – replaces EG3611A (10 units), EG2401A (2 units), and UE (4 units)
- ETP3202L Innovation & Enterprise Case Study & Analysis (8 units) – replaces CDE4301A (8 units out of 12 units)
- ETP3203L Innovation & Enterprise Internship Practicum (8 units) – replaces CDE4301A (4 units out of 12 units) and UE (4 units)
- Entrepreneurship courses (up to 8 units) – replaces Innovation & Enterprise electives (up to 8 units – students will need to complete additional Innovation & Enterprise Electives in NUS if they are unable to complete 8 units of entrepreneurship courses during NOC)

(updated 16 July 2025)

Innovation & Design Programme
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Recommended semester schedule – JC-intake students or equivalent

(for students in one-semester NOC programmes)

Semester 1	Units	Semester 2	Units
IPM1102 Infrastructure and Project Management Law	4	IPM1103I Digitalisation in the Built Environment	4
IPM1104 Built Environment Engineering Principles and Practice	4	CS1010E Programming Methodology	4
GEA1000 Quantitative Reasoning with Data	4	EG1311 Design and Make	4
DTK1234 Design Thinking	4	MA1511 Engineering Calculus	2
MA1513 Linear Algebra with Differential Equations	2	CE2407B Introduction to Numerical Methods for Engineers	2
CE2407A Uncertainty Analysis for Engineers	2	Group A/B course for Second Major	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
IPM2101 Introduction to Building Performance	4	IPM2103 Measurement (Building Works)	4
IPM2102 Construction Technology	4	IPM2104 Project Cost Management	4
CDE2501 Liveable Cities	4	ES2631 Critique and Communication of Thinking and Design	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	GEC/GEN	4
PF1101A Project Management and Finance	4	CDE3301 Ideas to Proof-of-Concept	6
Group A/B course for Second Major	4		
Sub-total	**24**	**Sub-total**	**22**

Semester 5	Units	Semester 6 – NOC	Units
CDE3301 Ideas to Proof-of-Concept	6	NOC	
IPM3102 Infrastructure and Facilities Management	4		
Additional technical course 1	4		
Additional technical course 2	4		
Sub-total	**18**	**Sub-total**	**22**

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6	CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6
IPM4102 Project Execution	4	Additional technical course 3	4
IPM4103 Contract and Procurement Management	4	UE	4
GEC/GEN	4	UE	2
Sub-total	**18**	**Sub-total**	**16**

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) – replaces Innovation & Enterprise Elective 1 (4 units)
- Entrepreneurship course (4 units) – replaces Innovation & Enterprise Elective 2 (4 units)

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Innovation & Design Programme
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Recommended semester schedule – poly-intake students

(for students who are exempted from DTK1234 and EG1311)

Semester 1	Units	Semester 2	Units
IPM1102 Infrastructure and Project Management Law	4	IPM1103I Digitalisation in the Built Environment	4
IPM1104 Built Environment Engineering Principles and Practice	4	CS1010E Programming Methodology	4
GEA1000 Quantitative Reasoning with Data	4	MA1511 Engineering Calculus	2
MA1301 Introductory Mathematics * (UE)	4	CE2407B Introduction to Numerical Methods for Engineers	2
Group A/B course for Second Major	4	CDE3301 Ideas to Proof-of-Concept	6
		Group A/B course for Second Major	4
Sub-total	**20**	**Sub-total**	**22**

Semester 3	Units	Semester 4	Units
MA1513 Linear Algebra with Differential Equations *	2	IPM2103 Measurement (Building Works)	4
CE2407A Uncertainty Analysis for Engineers *	2	IPM2104 Project Cost Management	4
IPM2101 Introduction to Building Performance	4	ES2631 Critique and Communication of Thinking and Design	4
IPM2102 Construction Technology	4	EE2211 Introduction to Machine Learning	4
CDE2501 Liveable Cities	4	GEC/GEN	4
PF1101A Project Management and Finance	4	GEC/GEN	4
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	**26**	**Sub-total**	**24**

Semester 5	Units	Semester 6	Units
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6	CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6
IPM3102 Infrastructure and Facilities Management	4	Innovation & Enterprise Elective 1	4
IPM4102 Project Execution	4	Innovation & Enterprise Elective 2	4
IPM4103 Contract and Procurement Management	4	Additional technical course 3	4
Additional technical course 1	4	EG2401A Engineering Professionalism	2
Additional technical course 2	4		
Sub-total	**26**	**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)
- EG3611P Industrial Attachment (10 units)
- Unrestricted electives (20 units)

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Recommended semester schedule – poly-intake students

(for students who are exempted from CDE2000 and PF1101)

Semester 1	Units	Semester 2	Units
IPM1102 Infrastructure and Project Management Law	4	IPM1103I Digitalisation in the Built Environment	4
IPM1104 Built Environment Engineering Principles and Practice	4	CS1010E Programming Methodology	4
GEA1000 Quantitative Reasoning with Data	4	EG1311 Design and Make	4
DTK1234 Design Thinking	4	MA1511 Engineering Calculus	2
MA1301 Introductory Mathematics * (UE)	4	CE2407B Introduction to Numerical Methods for Engineers	2
		Group A/B course for Second Major	4
		CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**20**	**Sub-total**	**26**

Semester 3	Units	Semester 4	Units
MA1513 Linear Algebra with Differential Equations *	2	IPM2103 Measurement (Building Works)	4
CE2407A Uncertainty Analysis for Engineers *	2	IPM2104 Project Cost Management	4
IPM2101 Introduction to Building Performance	4	ES2631 Critique and Communication of Thinking and Design	4
IPM2102 Construction Technology	4	GEC/GEN	4
CDE2501 Liveable Cities	4	GEC/GEN	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	Group A/B course for Second Major	4
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	**26**	**Sub-total**	**24**

Semester 5	Units	Semester 6	Units
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6	CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6
IPM3102 Infrastructure and Facilities Management	4	Innovation & Enterprise Elective 1	4
IPM4102 Project Execution	4	Innovation & Enterprise Elective 2	4
IPM4103 Contract and Procurement Management	4	Additional technical course 2	4
Additional technical course 1	4	EG2401A Engineering Professionalism	2
Sub-total	**22**	**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:

- CDE2000 Creating Narratives (4 units)
- PF1101 Fundamentals of Project Management (4 units)
- EG3611P Industrial Attachment (10 units)
- Unrestricted electives (20 units)

(updated 16 July 2025)