

**Bachelor of Engineering (Infrastructure & Project Management)
with Second Major in Innovation & Design**

Cohort AY2023/2024

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
GE: Cultures and Connections ¹	4
GE: Singapore Studies ¹	4
GE: Communities and Engagement ¹	4
CDE2000 Creating Narratives	4
CDE2501 Liveable Cities	4
DTK1234 Design Thinking	4
EE2211 Introduction to Machine Learning	4
EG1311 Design and Make	4
IE2141 Systems Thinking and Dynamics	4
PF1101 Fundamentals of Project Management	4
CDE4301 Innovation & Design Capstone <u>or</u> CDE4301A Ideas to Start-up (over 2 consecutive semesters) ²	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 <u>or</u> CFG2101 NUS Vacation Internship Programme ³ <u>and</u> EG3612 Vacation Industrial Attachment	10
Sub-total for Engineering Core	20
Engineering Programme Requirements	
IPM1102 Infrastructure and Project Management Law	4
IPM1103 Digital Construction	4
IPM2101 Introduction to Building Performance	4
IPM2102 Construction Technology	4
IPM2103 Measurement (Building Works)	4
IPM2104 Project Cost Management	4
IPM3101 Project Feasibility	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/EG3301R Ideas to Proof-of-Concept (over 2 consecutive semesters)	12
CDE4301 Innovation & Design Capstone <u>or</u> CDE4301A Ideas to Start-up (over 2 consecutive semesters) ²	4

Innovation & Design Programme
NUS College of Design and Engineering

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 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.
- ³ May be replaced by CDE2605 Undergraduate Research Opportunities Programme or CDE2605R Undergraduate Research Experience (UREx).

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	IPM1103 Digital Construction	4
GEA1000 Quantitative Reasoning with Data	4	CS1010E Programming Methodology	4
DTK1234 Design Thinking	4	EG1311 Design & 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 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	4	IE2141 Systems Thinking & Dynamics	4
GE	4	CDE3301/EG3301R 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/EG3301R Ideas to Proof-of-Concept	6	Innovation & Enterprise Elective 1	4
IPM3101 Project Feasibility	4	Innovation & Enterprise Elective 2	4
IPM3102 Infrastructure and Facilities Management	4	GE	4
CDE2000 Creating Narratives	4	GE	4
EG2401A Engineering Professionalism	2	UE	4
Sub-total	20	Sub-total	20

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
IPM4102 Project Execution	4	UE	4
IPM4103 Contract and Procurement Management	4		
Sub-total	14	Sub-total	10

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	IPM1103 Digital Construction	4
GEA1000 Quantitative Reasoning with Data	4	CS1010E Programming Methodology	4
DTK1234 Design Thinking	4	EG1311 Design & 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 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	4	IE2141 Systems Thinking & Dynamics	4
GE	4	CDE3301/EG3301R 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/EG3301R Ideas to Proof-of-Concept	6	EG3611A Industrial Attachment	10
IPM3101 Project Feasibility	4		
IPM3102 Infrastructure and Facilities Management	4		
CDE2000 Creating Narratives	4		
EG2401A Engineering Professionalism	2		
Sub-total	20	Sub-total	10

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
IPM4102 Project Execution	4	Innovation & Enterprise Elective 1	4
IPM4103 Contract and Procurement Management	4	Innovation & Enterprise Elective 2	4
GE *	4	UE	4
GE *	4	UE	4
Sub-total	22	Sub-total	22

* Students in UTCP and RVRC will need to overload in Semesters 2 to 4 in order to clear these courses earlier.

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	IPM1103 Digital Construction	4
GEA1000 Quantitative Reasoning with Data	4	CS1010E Programming Methodology	4
DTK1234 Design Thinking	4	EG1311 Design & 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 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	4	IE2141 Systems Thinking & Dynamics	4
GE	4	CDE3301/EG3301R 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/EG3301R Ideas to Proof-of-Concept	6	NOC	
IPM3101 Project Feasibility	4		
IPM3102 Infrastructure and Facilities Management	4		
IPM4102 Project Execution	4		
IPM4103 Contract and Procurement Management	4		
Sub-total	22	Sub-total	22

Semester 7 – NOC	Units	Semester 8	Units
NOC		CDE2000 Creating Narratives	4
		GE *	4
		GE *	4
		UE	2
Sub-total	20	Sub-total	12

* Students in UTCP and RVRC will need to overload in Semesters 2 to 4 in order to clear these courses earlier.

Innovation & Design Programme
NUS College of Design and Engineering

A year-long NOC programme comprises the following courses:

- 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)
- ETP2271 Discovering Resilience and Purpose (2 units) – counted as UE (2 units)
- Entrepreneurship courses (4 or 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)

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	IPM1103 Digital Construction	4
GEA1000 Quantitative Reasoning with Data	4	CS1010E Programming Methodology	4
DTK1234 Design Thinking	4	EG1311 Design & 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 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	4	IE2141 Systems Thinking & Dynamics	4
GE	4	CDE3301/EG3301R 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/EG3301R Ideas to Proof-of-Concept	6	NOC	
IPM3101 Project Feasibility	4		
IPM3102 Infrastructure and Facilities Management	4		
CDE2000 Creating Narratives	4		
Sub-total	18	Sub-total	22

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
IPM4102 Project Execution	4	GE	4
IPM4103 Contract and Procurement Management	4	UE	4
GE	4	UE	2
Sub-total	18	Sub-total	16

A one-semester NOC programme comprises the following courses:

- ETP3201L 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)
- ETP2271 Discovering Resilience and Purpose (2 units) – counted as UE (2 units)

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	IPM1103 Digital Construction	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 Second Major	4	CDE3301/EG3301R 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	IE2141 Systems Thinking & Dynamics	4
CDE2501 Liveable Cities	4	GE	4
GE	4	GE	4
CDE3301/EG3301R Ideas to Proof-of-Concept	6		
Sub-total	26	Sub-total	24

Semester 5	Units	Semester 6	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
IPM3101 Project Feasibility	4	Innovation & Enterprise Elective 1	4
IPM3102 Infrastructure and Facilities Management	4	Innovation & Enterprise Elective 2	4
IPM4102 Project Execution	4	CDE2000 Creating Narratives	4
IPM4103 Contract and Procurement Management	4	EG2401A Engineering Professionalism	2
EE2211 Introduction to Machine Learning	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 & Make (4 units)
- EG3611A Industrial Attachment (10 units)
- Unrestricted electives (20 units)

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	IPM1103 Digital Construction	4
GEA1000 Quantitative Reasoning with Data	4	CS1010E Programming Methodology	4
DTK1234 Design Thinking	4	EG1311 Design & Make	4
MA1301 Introductory Mathematics * (UE)	4	MA1511 Engineering Calculus	2
Group A/B course for Second Major	4	CE2407B Introduction to Numerical Methods for Engineers	2
		CDE3301/EG3301R Ideas to Proof-of-Concept	6
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	IE2141 Systems Thinking & Dynamics	4
CDE2501 Liveable Cities	4	GE	4
EE2211 Introduction to Machine Learning	4	Group A/B course for Second Major	4
CDE3301/EG3301R Ideas to Proof-of-Concept	6		
Sub-total	26	Sub-total	24

Semester 5	Units	Semester 6	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
IPM3101 Project Feasibility	4	Innovation & Enterprise Elective 1	4
IPM3102 Infrastructure and Facilities Management	4	Innovation & Enterprise Elective 2	4
IPM4102 Project Execution	4	GE	4
IPM4103 Contract and Procurement Management	4	EG2401A Engineering Professionalism	2
GE	4		
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)
- EG3611A Industrial Attachment (10 units)
- Unrestricted electives (20 units)