NUS Innovation & Design Programme
College of Design and Engineering

Bachelor of Engineering (Chemical Engineering) with Second Major in Innovation & Design

Cohort AY2025/2026

Course Requirements	Units
Common Curriculum	
GEA1000 Quantitative Reasoning with Data [1]	4
CS1010E Programming Methodology (or other variants)	4
CDE2501 Liveable Cities [2]	4
ES2631 Critique and Communication of Thinking and Design [2]	4
GE: Cultures and Connections [2]	4
GE: Communities and Engagement [2]	4
DTK1234 Design Thinking	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4
EG1311 Design and Make or EG1311BE Design and Make	4
PF1101A Project Management and Finance	4
Sub-total for Common Curriculum	**40**
Engineering Core	
MA1511 Engineering Calculus	2
MA1512 Differential Equations for Engineering	2
MA1513 Linear Algebra with Differential Equations	2
CE2407A Uncertainty Analysis for Engineers	2
EG2401A Engineering Professionalism	2
EG3611A Industrial Attachment or CFG2101 NUS Vacation Internship Programme [3] and EG3612 Vacation Industrial Attachment	10
Sub-total for Engineering Core	**20**
Engineering Programme Requirements	
CN1101A Chemical Engineering Principles and Practice I	4
CN2102 Chemical Engineering Principles and Practice II	4
CN2103 Material and Energy Balances	4
CN2104 Chemical Engineering Thermodynamics	4
CN2105 Reaction Engineering	4
CN2109 Fluid Mechanics	4
CN2110 Heat and Mass Transfer	4
CN2111 Fundamentals of Biomolecular Engineering	4
CN3104 Computer-Aided Chemical Process Simulation	4
CN3105 Machine Learning in Chemical Engineering	4
CN3106 Separation Processes	4
CN4101 Process Control and Safety	4
CN4102 Chemical Engineering Lab	4
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) [4]	8
Sub-total for Engineering Programme Requirements	**60**
Unrestricted Electives	
CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters) [5]	12
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) [4]	4
Electives for Second Major [5]	16
Other unrestricted electives	8
Sub-total for Unrestricted Electives	**40**
Total	**160**

(updated 24 May 2025)

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Notes:

[1] Students may read other approved courses for Data Literacy in lieu of GEA1000.

[2] Students may read equivalent courses in NUS College (NUSC), University Town College Programme (UTCP), and Ridge View Residential Programme (RVRC). CDE2501 fulfils GE: Singapore Studies while ES2631 fulfils GE: Critique and Expression.

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

[4] The 12 units for CDE4301/CDE4301A are counted towards 8 units for Integrated Project while 4 units are counted as unrestricted elective.

[5] Students should clear at least one elective course from List I prior to CDE3301.

(updated 24 May 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
CN1101A Chemical Engineering Principles and Practice I	4	CN2102 Chemical Engineering Principles and Practice II	4
GEA1000 Quantitative Reasoning with Data	4	CN2103 Material and Energy Balances	4
DTK1234 Design Thinking	4	CS1010E Programming Methodology	4
MA1513 Linear Algebra with Differential Equations	2	EG1311 Design and Make or EG1311BE Design and Make	4
CE2407A Uncertainty Analysis for Engineers	2	MA1511 Engineering Calculus	2
PF1101A Project Management and Finance	4	MA1512 Differential Equations for Engineering	2
		Elective 1 for Second Major (from List I)	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
CN2104 Chemical Engineering Thermodynamics	4	CN2105 Reaction Engineering	4
CN2109 Fluid Mechanics	4	CN2110 Heat and Mass Transfer	4
CDE2501 Liveable Cities	4	CN2111 Fundamentals of Biomolecular Engineering	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	ES2631 Critique and Communication of Thinking and Design	4
Elective 2 for Second Major (from List I)	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	Elective 3 for Second Major	4
CN3104 Computer-Aided Chemical Process Simulation	4	GE	4
CN3105 Machine Learning in Chemical Engineering	4	GE	4
CN3106 Separation Processes	4	UE	4
EG2401A Engineering Professionalism	2	UE	4
Sub-total	**20**	**Sub-total**	**20**

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
Elective 4 for Second Major	4	CN4102 Chemical Engineering Lab	4
CN4101 Process Control and Safety	4		
Sub-total	**14**	**Sub-total**	**10**

(updated 24 May 2025)

NUS Innovation & Design Programme
College of Design and Engineering

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

Semester 1	Units	Semester 2	Units
CN1101A Chemical Engineering Principles and Practice I	4	CN2102 Chemical Engineering Principles and Practice II	4
GEA1000 Quantitative Reasoning with Data	4	CN2103 Material and Energy Balances	4
DTK1234 Design Thinking	4	CS1010E Programming Methodology	4
MA1513 Linear Algebra with Differential Equations	2	EG1311 Design and Make or EG1311BE Design and Make	4
CE2407A Uncertainty Analysis for Engineers	2	MA1511 Engineering Calculus	2
PF1101A Project Management and Finance	4	MA1512 Differential Equations for Engineering	2
		Elective 1 for Second Major (from List I)	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
CN2104 Chemical Engineering Thermodynamics	4	CN2105 Reaction Engineering	4
CN2109 Fluid Mechanics	4	CN2110 Heat and Mass Transfer	4
CDE2501 Liveable Cities	4	CN2111 Fundamentals of Biomolecular Engineering	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	ES2631 Critique and Communication of Thinking and Design	4
Elective 2 for Second Major (from List I)	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	Elective 3 for Second Major	4
CN3104 Computer-Aided Chemical Process Simulation	4	GE	4
CN3105 Machine Learning in Chemical Engineering	4	GE	4
CN3106 Separation Processes	4	Specialisation course 1	4
EG2401A Engineering Professionalism	2	Specialisation course 2	4
Sub-total	**20**	**Sub-total**	**20**

(updated 24 May 2025)

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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
Elective 4 for Second Major	4	CN4102 Chemical Engineering Lab	4
CN4101 Process Control and Safety	4	Specialisation course 4	4
Specialisation course 3	4	Specialisation course 5	4
Sub-total	**14**	**Sub-total**	**10**

(updated 24 May 2025)

NUS Innovation & Design Programme
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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
CN1101A Chemical Engineering Principles and Practice I	4	CN2102 Chemical Engineering Principles and Practice II	4
GEA1000 Quantitative Reasoning with Data	4	CN2103 Material and Energy Balances	4
DTK1234 Design Thinking	4	CS1010E Programming Methodology	4
MA1513 Linear Algebra with Differential Equations	2	EG1311 Design and Make or EG1311BE Design and Make	4
CE2407A Uncertainty Analysis for Engineers	2	MA1511 Engineering Calculus	2
PF1101A Project Management and Finance	4	MA1512 Differential Equations for Engineering	2
		Elective 1 for Second Major (from List I)	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	Units	Semester 4	Units
CN2104 Chemical Engineering Thermodynamics	4	CN2105 Reaction Engineering	4
CN2109 Fluid Mechanics	4	CN2110 Heat and Mass Transfer	4
CDE2501 Liveable Cities	4	CN2111 Fundamentals of Biomolecular Engineering	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	ES2631 Critique and Communication of Thinking and Design	4
Elective 2 for Second Major (from List I)	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
CN3104 Computer-Aided Chemical Process Simulation	4		
CN3105 Machine Learning in Chemical Engineering	4		
CN3106 Separation Processes	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
Elective 3 for Second Major	4	Elective 4 for Second Major	4
CN4101 Process Control and Safety	4	CN4102 Chemical Engineering Lab	4
GE	4	UE	4
GE	4	UE	4
Sub-total	**22**	**Sub-total**	**22**

(updated 24 May 2025)

NUS Innovation & Design Programme
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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
CN1101A Chemical Engineering Principles and Practice I	4	CN2102 Chemical Engineering Principles and Practice II	4
GEA1000 Quantitative Reasoning with Data	4	CN2103 Material and Energy Balances	4
DTK1234 Design Thinking	4	CS1010E Programming Methodology	4
MA1513 Linear Algebra with Differential Equations	2	EG1311 Design and Make or EG1311BE Design and Make	4
CE2407A Uncertainty Analysis for Engineers	2	MA1511 Engineering Calculus	2
PF1101A Project Management and Finance	4	MA1512 Differential Equations for Engineering	2
		Elective 1 for Second Major (from List I)	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	Units	Semester 4	Units
CN2104 Chemical Engineering Thermodynamics	4	CN2105 Reaction Engineering	4
CN2109 Fluid Mechanics	4	CN2110 Heat and Mass Transfer	4
CDE2501 Liveable Cities	4	CN2111 Fundamentals of Biomolecular Engineering	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	ES2631 Critique and Communication of Thinking and Design	4
Elective 2 for Second Major (from List I)	4	CDE3301 Ideas to Proof-of-Concept	6
GE	4		
Sub-total	**24**	**Sub-total**	**22**

Semester 5	Units	Semester 6	Units
CDE3301 Ideas to Proof-of-Concept	6	EG3611A Industrial Attachment	10
CN3104 Computer-Aided Chemical Process Simulation	4	Specialisation course 1	4
CN3105 Machine Learning in Chemical Engineering	4		
CN3106 Separation Processes	4		
EG2401A Engineering Professionalism	2		
GE	4		
Sub-total	**24**	**Sub-total**	**14**

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
Elective 3 for Second Major	4	Elective 4 for Second Major	4
CN4101 Process Control and Safety	4	CN4102 Chemical Engineering Lab	4
Specialisation course 2	4	Specialisation course 4	4
Specialisation course 3	4	Specialisation course 5	4
Sub-total	**22**	**Sub-total**	**22**

(updated 24 May 2025)

NUS Innovation & Design Programme
College of Design and Engineering

Recommended semester schedule – JC-intake students or equivalent

(for students in year-long NOC programmes)

Semester 1	Units	Semester 2	Units
CN1101A Chemical Engineering Principles and Practice I	4	CN2102 Chemical Engineering Principles and Practice II	4
GEA1000 Quantitative Reasoning with Data	4	CN2103 Material and Energy Balances	4
DTK1234 Design Thinking	4	CS1010E Programming Methodology	4
MA1513 Linear Algebra with Differential Equations	2	EG1311 Design and Make or EG1311BE Design and Make	4
CE2407A Uncertainty Analysis for Engineers	2	MA1511 Engineering Calculus	2
PF1101A Project Management and Finance	4	MA1512 Differential Equations for Engineering	2
		Elective 1 for Second Major (from List I)	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	Units	Semester 4	Units
CN2104 Chemical Engineering Thermodynamics	4	CN2105 Reaction Engineering	4
CN2109 Fluid Mechanics	4	CN2110 Heat and Mass Transfer	4
CDE2501 Liveable Cities	4	CN2111 Fundamentals of Biomolecular Engineering	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	ES2631 Critique and Communication of Thinking and Design	4
Elective 2 for Second Major (from List I)	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**20**	**Sub-total**	**22**

Semester 5	Units	Semester 6 – NOC	Units
CDE3301 Ideas to Proof-of-Concept	6	NOC	
CN3104 Computer-Aided Chemical Process Simulation	4		
CN3105 Machine Learning in Chemical Engineering	4		
CN3106 Separation Processes	4		
CN4101 Process Control and Safety	4		
Sub-total	**22**	**Sub-total**	**20**

Semester 7 – NOC	Units	Semester 8	Units
NOC		CN4102 Chemical Engineering Lab	4
		GE	4
		GE	4
Sub-total	**20**	**Sub-total**	**12**

(updated 24 May 2025)

NUS Innovation & Design Programme
College of Design and Engineering

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 Electives 3 and 4 for Second Major (students will need to complete Electives 3 and/or 4 for Second Major in NUS if they are unable to complete 8 units of entrepreneurship courses during NOC)

(updated 24 May 2025)

NUS Innovation & Design Programme
College of Design and Engineering

Recommended semester schedule – JC-intake students or equivalent

(for students in one-semester NOC programmes)

Semester 1	Units	Semester 2	Units
CN1101A Chemical Engineering Principles and Practice I	4	CN2102 Chemical Engineering Principles and Practice II	4
GEA1000 Quantitative Reasoning with Data	4	CN2103 Material and Energy Balances	4
DTK1234 Design Thinking	4	CS1010E Programming Methodology	4
MA1513 Linear Algebra with Differential Equations	2	EG1311 Design and Make or EG1311BE Design and Make	4
CE2407A Uncertainty Analysis for Engineers	2	MA1511 Engineering Calculus	2
PF1101A Project Management and Finance	4	MA1512 Differential Equations for Engineering	2
		Elective 1 for Second Major (from List I)	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	Units	Semester 4	Units
CN2104 Chemical Engineering Thermodynamics	4	CN2105 Reaction Engineering	4
CN2109 Fluid Mechanics	4	CN2110 Heat and Mass Transfer	4
CDE2501 Liveable Cities	4	CN2111 Fundamentals of Biomolecular Engineering	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	ES2631 Critique and Communication of Thinking and Design	4
Elective 2 for Second Major (from List I)	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**20**	**Sub-total**	**22**

Semester 5	Units	Semester 6 – NOC	Units
CDE3301 Ideas to Proof-of-Concept	6	NOC	
CN3104 Computer-Aided Chemical Process Simulation	4		
CN3105 Machine Learning in Chemical Engineering	4		
CN3106 Separation Processes	4		
Sub-total	**18**	**Sub-total**	**20**

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
CN4101 Process Control and Safety	4	CN4102 Chemical Engineering Lab	4
GE	4	UE	4
GE	4	UE	4
Sub-total	**18**	**Sub-total**	**18**

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 (Short) (4 units) – replaces Elective 3 for Second Major (4 units)
- Entrepreneurship course (4 units) – replaces Elective 4 for Second Major (4 units)

(updated 24 May 2025)

NUS Innovation & Design Programme
College of Design and Engineering

Recommended semester schedule – JC-intake students or equivalent

(for students in Engineering Scholars Programme who plan to go for SEP)

Semester 1	Units	Semester 2	Units
CN1101A Chemical Engineering Principles and Practice I	4	CN2102 Chemical Engineering Principles and Practice II	4
GEA1000 Quantitative Reasoning with Data	4	CN2103 Material and Energy Balances	4
DTK1234 Design Thinking	4	MA1512 Differential Equations for Engineering	2
MA1513 Linear Algebra with Differential Equations	2	UE	4
CE2407A Uncertainty Analysis for Engineers	2	RVRC/UTCP course 2 (replaces GE)	4
PF1101A Project Management and Finance	4	Elective 1 for Second Major (from List I)	4
RVRC/UTCP course 1 (replaces GE)	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**24**	**Sub-total**	**28**

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

Semester 3	Units	Semester 4 – can be used for SEP	Units
CN2104 Chemical Engineering Thermodynamics	4	CN2105 Reaction Engineering	4
CN2109 Fluid Mechanics	4	CN2110 Heat and Mass Transfer	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	CN2111 Fundamentals of Biomolecular Engineering	4
RVRC/UTCP course 3 (replaces CDE2501)	4	RVRC/UTCP course 4 (replaces ES2631)	4
Elective 2 for Second Major (from List I)	4	Elective 3 for Second Major	4
CDE3301 Ideas to Proof-of-Concept	6	EG2401A Engineering Professionalism	2
Sub-total	**26**	**Sub-total**	**22**

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

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
CN3104 Computer-Aided Chemical Process Simulation	4	Elective 4 for Second Major	4
CN3105 Machine Learning in Chemical Engineering	4	CN4102 Chemical Engineering Lab	4
CN3106 Separation Processes	4	UE	2
CN4101 Process Control and Safety	4		
Sub-total	**22**	**Sub-total**	**16**

(updated 24 May 2025)

NUS Innovation & Design Programme
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Students are highly encouraged to 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)

CFG2101 may be replaced by CDE2605 Undergraduate Research Opportunities Programme or CDE2605R Undergraduate Research Experience (UREx).

(updated 24 May 2025)

NUS Innovation & Design Programme
College of Design and Engineering

Recommended semester schedule – JC-intake students or equivalent
(for students in Engineering Scholars Programme who plan to go for one-semester NOC programmes)

Semester 1	Units	Semester 2	Units
CN1101A Chemical Engineering Principles and Practice I	4	CN2102 Chemical Engineering Principles and Practice II	4
GEA1000 Quantitative Reasoning with Data	4	CN2103 Material and Energy Balances	4
DTK1234 Design Thinking	4	MA1512 Differential Equations for Engineering	2
MA1513 Linear Algebra with Differential Equations	2	UE	4
CE2407A Uncertainty Analysis for Engineers	2	RVRC/UTCP course 2 (replaces GE)	4
PF1101A Project Management and Finance	4	Elective 1 for Second Major (from List I)	4
RVRC/UTCP course 1 (replaces GE)	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**24**	**Sub-total**	**28**

Semester 3	Units	Semester 4 – NOC	Units
CN2104 Chemical Engineering Thermodynamics	4	NOC	
CN2109 Fluid Mechanics	4		
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4		
RVRC/UTCP course 3 (replaces CDE2501)	4		
Elective 2 for Second Major (from List I)	4		
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	**26**	**Sub-total**	**20**

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
CN3104 Computer-Aided Chemical Process Simulation	4	CN2105 Reaction Engineering	4
CN3105 Machine Learning in Chemical Engineering	4	CN2110 Heat and Mass Transfer	4
CN3106 Separation Processes	4	CN2111 Fundamentals of Biomolecular Engineering	4
CN4101 Process Control and Safety	4	CN4102 Chemical Engineering Lab	4
RVRC/UTCP course 4 (replaces ES2631)	4	UE	2
Sub-total	**26**	**Sub-total**	**24**

(updated 24 May 2025)

NUS Innovation & Design Programme
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Students are highly encouraged to 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)

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 (Short) (4 units) – replaces Elective 3 for Second Major (4 units)
- Entrepreneurship course (4 units) – replaces Elective 4 for Second Major (4 units)

(updated 24 May 2025)

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

Semester 1	Units	Semester 2	Units
CN1101A Chemical Engineering Principles and Practice I	4	CN2102 Chemical Engineering Principles and Practice II	4
GEA1000 Quantitative Reasoning with Data	4	CN2103 Material and Energy Balances	4
PF1101A Project Management and Finance	4	CS1010E Programming Methodology	4
MA1301 Introductory Mathematics * (UE)	4	MA1511 Engineering Calculus	2
Elective 1 for Second Major (from List I)	4	MA1512 Differential Equations for Engineering	2
		Elective 2 for Second Major (from List I)	4
		CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**20**	**Sub-total**	**26**

Semester 3	Units	Semester 4	Units
CN2104 Chemical Engineering Thermodynamics	4	CN2105 Reaction Engineering	4
CN2109 Fluid Mechanics	4	CN2110 Heat and Mass Transfer	4
CDE2501 Liveable Cities	4	CN2111 Fundamentals of Biomolecular Engineering	4
MA1513 Linear Algebra with Differential Equations *	2	ES2631 Critique and Communication of Thinking and Design	4
CE2407A Uncertainty Analysis for Engineers *	2	GE	4
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4	Elective 3 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
CN3104 Computer-Aided Chemical Process Simulation	4	Elective 4 for Second Major	4
CN3105 Machine Learning in Chemical Engineering	4	CN4102 Chemical Engineering Lab	4
CN3106 Separation Processes	4	GE	4
CN4101 Process Control and Safety	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:

- DTK1234 Design Thinking (4 units)
- EG1311B Design and Make (4 units)
- EG3611P Industrial Attachment (10 units)
- Unrestricted electives (20 units)

(updated 24 May 2025)