Bachelor of Engineering (Environmental and Sustainability 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	4
or EE2213 Introduction to Artificial Intelligence	
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	10
CFG2101 NUS Vacation Internship Programme ³ and EG3612 Vacation Industrial	
Attachment	
Sub-total for Engineering Core	20
Engineering Programme Requirements	
CE2134 Fluid Mechanics	4
ESE2101 Environmental Science and Engineering Principles and Practice	4
ESE2102 Principles and Practice in Environmental Monitoring	4
ESE2000 Chemistry for An Environmentally Sustainable Future	
	4
ESE2001 Environmental Challenges in the Anthropocene	4
ESE2001 Environmental Challenges in the Anthropocene ESE3101 Resource Management and Circular Economy	
ESE3101 Resource Management and Circular Economy	4
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment	4
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment	4 4 4
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology	4 4 4 4
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment	4 4 4 4 4
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project	4 4 4 4 4 4 4
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project Technical electives	4 4 4 4 4 4 4 8
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project Technical electives CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	4 4 4 4 4 4 4
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project Technical electives CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) 4	4 4 4 4 4 4 4 8
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project Technical electives CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	4 4 4 4 4 4 4 8 8
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project Technical electives CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) Sub-total for Engineering Programme Requirements Unrestricted Electives	4 4 4 4 4 4 4 8 8
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project Technical electives CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) Sub-total for Engineering Programme Requirements Unrestricted Electives CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters) 5	4 4 4 4 4 4 4 8 8
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project Technical electives CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) Sub-total for Engineering Programme Requirements Unrestricted Electives CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	4 4 4 4 4 4 4 8 8 8
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project Technical electives CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) Sub-total for Engineering Programme Requirements Unrestricted Electives CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters)	4 4 4 4 4 4 8 8 8 60
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project Technical electives CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) Sub-total for Engineering Programme Requirements Unrestricted Electives CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) EDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) Electives for Second Major Electives for Second Major Electives	4 4 4 4 4 4 4 8 8 8 8
ESE3101 Resource Management and Circular Economy ESE3201 Air Quality in Changing Environment ESE3301 Microbiology in Natural and Built Environment ESE3401 Sustainable Urban Water Technology ESE4408 Environmental Impact Assessment ESE4501 Design Project Technical electives CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) Sub-total for Engineering Programme Requirements Unrestricted Electives CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters) CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters)	4 4 4 4 4 4 8 8 8 60

Notes:

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

Recommended semester schedule – JC-intake students or equivalent

(for students who opt for vacation internships)

Semester 1	Units	Semester 2	Units
ESE2101 Environmental Science and	4	ESE2102 Principles and Practice in	4
Engineering Principles and Practice	4	Environmental Monitoring	4
GEA1000 Quantitative Reasoning with	4	CS1010E Programming Methodology	4
Data	4	CS1010E Programming Methodology	4
DTK1234 Design Thinking	4	EG1311 Design and Make	4
DTK1234 Design Hilliking	4	or EG1311BE Design and Make	4
MA1513 Linear Algebra with Differential	2	MA1511 Engineering Calculus	2
Equations	2	IVIATSTT Engineering Calculus	2
CE2407A Uncertainty Analysis for	2	MA1512 Differential Equations for	2
Engineers		Engineering	2
PF1101A Project Management and	4	Floating 1 for Second Major (from List I)	4
Finance	4	Elective 1 for Second Major (from List I)	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
CE2134 Fluid Mechanics	4	ESE3101 Resource Management and	4
CEZ134 Fluid Mechanics	4	Circular Economy	
ESE2000 Chemistry for An	4	ESE3301 Microbiology in Natural and	4
Environmentally Sustainable Future	4	Built Environment	4
ESE2001 Environmental Challenges in the	4	ES2631 Critique and Communication of	4
Anthropocene	4	Thinking and Design	4
EE2211 Introduction to Machine			
Learning or EE2213 Introduction to	4	GE	4
Artificial Intelligence			
EG2401A Engineering Professionalism	2	CDE3301 Ideas to Proof-of-Concept	6
Elective 2 for Second Major (from List I)	4		
Sub-total	22	Sub-total 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
ESE3201 Air Quality in Changing Environment	4	Elective 3 for Second Major	4
ESE3401 Sustainable Urban Water Technology	4	Technical Elective 1	4
CDE2501 Liveable Cities	4	GE	4
CDE3301 Ideas to Proof-of-Concept	6	UE	4
		UE	4
Sub-total	18	Sub-total	20

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
or CDE4301A Ideas to Start-up	O	or CDE4301A Ideas to Start-up	0
ESE4501 Design Project	4	Elective 4 for Second Major	4
Technical Elective 2	4	ESE4408 Environmental Impact	4
	4	Assessment	4
Sub-total	14	Sub-total Sub-total	14

Recommended semester schedule – JC-intake students or equivalent

(for students who opt for vacation internships plus a specialisation)

Semester 1	Units	Semester 2	Units	
ESE2101 Environmental Science and	4	ESE2102 Principles and Practice in	4	
Engineering Principles and Practice	4	Environmental Monitoring	4	
GEA1000 Quantitative Reasoning with	4	CC1010F Programming Mathedalogy	4	
Data	4	CS1010E Programming Methodology	4	
DTV1224 Design Thinking	4	EG1311 Design and Make	4	
DTK1234 Design Thinking	4	4	or EG1311BE Design and Make	4
MA1513 Linear Algebra with Differential	2	MAAIF11 Engineering Coloulus	2	
Equations	2	MA1511 Engineering Calculus	2	
CE2407A Uncertainty Analysis for	2	MA1512 Differential Equations for	2	
Engineers	2	Engineering	2	
PF1101A Project Management and	4	Floative 1 for Cooped Major (from List I)	4	
Finance	4	Elective 1 for Second Major (from List I)	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
CE2134 Fluid Mechanics	4	ESE3101 Resource Management and	4
CE2134 Fluid Mechanics	4	Circular Economy	
ESE2000 Chemistry for An	4	ESE3301 Microbiology in Natural and	4
Environmentally Sustainable Future	4	Built Environment	4
ESE2001 Environmental Challenges in the	4	ES2631 Critique and Communication of	4
Anthropocene	4	Thinking and Design	4
EE2211 Introduction to Machine			
Learning or EE2213 Introduction to	4	GE	4
Artificial Intelligence			
EG2401A Engineering Professionalism	2	CDE3301 Ideas to Proof-of-Concept	6
Elective 2 for Second Major (from List I)	4		
Sub-total	22	Sub-total 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
ESE3201 Air Quality in Changing Environment	4	Elective 3 for Second Major	4
ESE3401 Sustainable Urban Water Technology	4	Specialisation course 1	4
CDE2501 Liveable Cities	4	Specialisation course 2	4
CDE3301 Ideas to Proof-of-Concept	6	Specialisation course 3	4
		GE	4
Sub-total	18	Sub-total Sub-total	20

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
or CDE4301A Ideas to Start-up	O	or CDE4301A Ideas to Start-up	b
ESE4501 Design Project	4	Elective 4 for Second Major	4
Considiration accord	4	ESE4408 Environmental Impact	4
Specialisation course 4	4	Assessment	
		Specialisation course 5	4
Sub-total	14	Sub-total Sub-total	18

Recommended semester schedule – JC-intake students or equivalent

(for students who opt for industrial attachment)

Semester 1	Units	Semester 2	Units
ESE2101 Environmental Science and	4	ESE2102 Principles and Practice in	4
Engineering Principles and Practice	4	Environmental Monitoring	4
GEA1000 Quantitative Reasoning with	4	CC1010F Programming Mathedalogy	4
Data	4	CS1010E Programming Methodology	4
DTV1224 Decise Thinking	4	EG1311 Design and Make	4
DTK1234 Design Thinking	4	or EG1311BE Design and Make	
MA1513 Linear Algebra with Differential	2	NAA1511 Franka aring Calaulus	2
Equations	2	MA1511 Engineering Calculus	2
CE2407A Uncertainty Analysis for	2	MA1512 Differential Equations for	2
Engineers	2	Engineering	2
PF1101A Project Management and	4	Floating 1 for Cooped Major (from List I)	4
Finance	4	Elective 1 for Second Major (from List I)	4
Sub-total Sub-total	20	Sub-total	20

Semester 3	Units	Semester 4	Units
CE2134 Fluid Mechanics	4	ESE3101 Resource Management and	4
CE2134 Fluid Mechanics		Circular Economy	4
ESE2000 Chemistry for An	4	ESE3301 Microbiology in Natural and	4
Environmentally Sustainable Future	4	Built Environment	4
ESE2001 Environmental Challenges in the	4	ES2631 Critique and Communication of	4
Anthropocene	4	Thinking and Design	4
EE2211 Introduction to Machine			
Learning <u>or</u> EE2213 Introduction to	4	GE	4
Artificial Intelligence			
EG2401A Engineering Professionalism	2	CDE3301 Ideas to Proof-of-Concept	6
Elective 2 for Second Major (from List I)	4		
Sub-total	22	Sub-total Sub-total	22

Semester 5	Units	Semester 6	Units
ESE3201 Air Quality in Changing	4	EG3611A Industrial Attachment	10
Environment	4		10
ESE3401 Sustainable Urban Water	4		
Technology	4		
CDE2501 Liveable Cities	4		
GE	4		
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	22	Sub-total	20

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
or CDE4301A Ideas to Start-up	O	or CDE4301A Ideas to Start-up	0
Elective 3 for Second Major	4	Elective 4 for Second Major	4
ECCACOA Daning Dunington	4	ESE4408 Environmental Impact	4
ESE4501 Design Project		Assessment	
Technical Elective 1	4	Technical Elective 2	4
UE	4	UE	4
Sub-total	22	Sub-total	22

Recommended semester schedule – JC-intake students or equivalent

(for students who opt for industrial attachment plus a specialisation)

Semester 1	Units	Semester 2	Units
ESE2101 Environmental Science and	4	ESE2102 Principles and Practice in	4
Engineering Principles and Practice	4	Environmental Monitoring	4
GEA1000 Quantitative Reasoning with	4	CC1010F Programming Mathedalogy	4
Data	4	CS1010E Programming Methodology	4
DTV1224 Design Thinking	4	EG1311 Design and Make	4
DTK1234 Design Thinking	4	or EG1311BE Design and Make	
MA1513 Linear Algebra with Differential	2	MAAIF11 Engineering Coloulus	2
Equations	2	MA1511 Engineering Calculus	2
CE2407A Uncertainty Analysis for	2	MA1512 Differential Equations for	2
Engineers		Engineering	2
PF1101A Project Management and	4	Floative 1 for Cooped Major (from List I)	4
Finance	4	Elective 1 for Second Major (from List I)	4
Sub-total	20	Sub-total	20

Semester 3	Units	Semester 4	Units
CE2134 Fluid Mechanics	4	ESE3101 Resource Management and	4
CE2134 Fluid Mechanics		Circular Economy	4
ESE2000 Chemistry for An	4	ESE3301 Microbiology in Natural and	4
Environmentally Sustainable Future	4	Built Environment	4
ESE2001 Environmental Challenges in the	4	ES2631 Critique and Communication of	4
Anthropocene	4	Thinking and Design	4
EE2211 Introduction to Machine			
Learning or EE2213 Introduction to	4	GE	4
Artificial Intelligence			
EG2401A Engineering Professionalism	2	CDE3301 Ideas to Proof-of-Concept	6
Elective 2 for Second Major (from List I)	4		
Sub-total Sub-total	22	Sub-total Sub-total	22

Semester 5	Units	Semester 6	Units
ESE3201 Air Quality in Changing	4	EG3611A Industrial Attachment	10
Environment	·		
ESE3401 Sustainable Urban Water	4	Specialisation course 1	4
Technology	4		4
CDE2501 Liveable Cities	4		
GE	4		
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	22	Sub-total	14

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
or CDE4301A Ideas to Start-up	O	or CDE4301A Ideas to Start-up	U
Elective 3 for Second Major	4	Elective 4 for Second Major	4
ESSASOA Danima Duniant	4	ESE4408 Environmental Impact	4
ESE4501 Design Project	4	Assessment	4
Specialisation course 2	4	Specialisation course 4	4
Specialisation course 3	4	Specialisation course 5	4
Sub-total	22	Sub-total	22

Recommended semester schedule – JC-intake students or equivalent

(for students in year-long NOC programmes)

Semester 1	Units	Semester 2	Units
ESE2101 Environmental Science and	4	ESE2102 Principles and Practice in	4
Engineering Principles and Practice	4	Environmental Monitoring	4
GEA1000 Quantitative Reasoning with	4	CC1010F Programming Mathedalogy	4
Data	4	CS1010E Programming Methodology	4
DTV1224 Decise Thinking	4	EG1311 Design and Make	4
DTK1234 Design Thinking	4	or EG1311BE Design and Make	
MA1513 Linear Algebra with Differential	2	NAA1511 Franka aring Calaulus	2
Equations	2	MA1511 Engineering Calculus	2
CE2407A Uncertainty Analysis for	2	MA1512 Differential Equations for	2
Engineers	2	Engineering	2
PF1101A Project Management and	4	Floating 1 for Cooped Major (from List I)	4
Finance	4	Elective 1 for Second Major (from List I)	4
Sub-total Sub-total	20	Sub-total	20

Semester 3	Units	Semester 4	Units
CE2134 Fluid Mechanics	4	ESE3101 Resource Management and	4
CL2134 Hala Mechanics	4	Circular Economy	4
ESE2000 Chemistry for An	4	ESE3301 Microbiology in Natural and	4
Environmentally Sustainable Future	4	Built Environment	4
ESE2001 Environmental Challenges in the	4	ES2631 Critique and Communication of	4
Anthropocene	4	Thinking and Design	4
EE2211 Introduction to Machine			
Learning or EE2213 Introduction to	4	GE	4
Artificial Intelligence			
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
ESE3201 Air Quality in Changing	4		
Environment	4		
ESE3401 Sustainable Urban Water	4		
Technology	4	NOC	
CDE2501 Liveable Cities	4		
ESE4501 Design Project	4		
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	22	Sub-total	20

Semester 7 – NOC	Units	Semester 8	Units
		ESE4408 Environmental Impact	4
		Assessment	
NOC		Technical Elective 1	4
		Technical Elective 2	4
		GE	4
Sub-total Sub-total	20	Sub-total	16

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)

Recommended semester schedule – JC-intake students or equivalent

(for students in one-semester NOC programmes)

Semester 1	Units	Semester 2	Units
ESE2101 Environmental Science and	4	ESE2102 Principles and Practice in	4
Engineering Principles and Practice	4	Environmental Monitoring	4
GEA1000 Quantitative Reasoning with	4	CC1010F Programming Mathedalogy	4
Data	4	CS1010E Programming Methodology	4
DTK1224 Design Thinking	4	EG1311 Design and Make	4
DTK1234 Design Thinking		or EG1311BE Design and Make	
MA1513 Linear Algebra with Differential	2	MAAIF11 Engineering Coloulus	2
Equations	2	MA1511 Engineering Calculus	2
CE2407A Uncertainty Analysis for	2	MA1512 Differential Equations for	2
Engineers		Engineering	2
PF1101A Project Management and	4	Floative 1 for Cooped Major (from List I)	4
Finance	4	Elective 1 for Second Major (from List I)	4
Sub-total	20	Sub-total	20

Semester 3	Units	Semester 4	Units
CE2134 Fluid Mechanics	4	ESE3101 Resource Management and	4
CE2134 Fluid Mechanics	4	Circular Economy	4
ESE2000 Chemistry for An	4	ESE3301 Microbiology in Natural and	4
Environmentally Sustainable Future	4	Built Environment	4
ESE2001 Environmental Challenges in the	4	ES2631 Critique and Communication of	4
Anthropocene	4	Thinking and Design	4
EE2211 Introduction to Machine			
Learning or EE2213 Introduction to	4	GE	4
Artificial Intelligence			
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
ESE3201 Air Quality in Changing	4		
Environment	4		
ESE3401 Sustainable Urban Water	4		
Technology	4	NOC	
CDE2501 Liveable Cities	4		
GE	4		
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	22	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
ESE4501 Design Project	4	ESE4408 Environmental Impact Assessment	4
Technical Elective 1	4	Technical Elective 2	4
UE	4	UE	4
Sub-total	18	Sub-total 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)

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
ESE2101 Environmental Science and	4	ESE2102 Principles and Practice in	4
Engineering Principles and Practice	4	Environmental Monitoring	4
GEA1000 Quantitative Reasoning with	4	ESE3101 Resource Management and	4
Data	4	Circular Economy	4
DTK1224 Decise Thinking	4	MA1512 Differential Equations for	2
DTK1234 Design Thinking		Engineering	
MA1513 Linear Algebra with Differential	2	DVPC/LITCD course 2 (replaces CE)	1
Equations	2	RVRC/UTCP course 2 (replaces GE)	4
CE2407A Uncertainty Analysis for	2	Elective 1 for Second Major (from List I)	4
Engineers		Elective 1 for Second Major (from List f)	4
PF1101A Project Management and	4	CDE2201 Ideas to Broof of Concept	6
Finance	4	CDE3301 Ideas to Proof-of-Concept	0
RVRC/UTCP course 1 (replaces GE)	4		
Sub-total	24	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 – can be used for SEP	Units
CE2134 Fluid Mechanics	4	ESE3301 Microbiology in Natural and	4
CL2134 Fluid Wechanics	4	Built Environment	4
ESE2000 Chemistry for An		EE2211 Introduction to Machine Learning	
•	4	or EE2213 Introduction to Artificial	4
Environmentally Sustainable Future		Intelligence	
ESE2001 Environmental Challenges in the	4	DVDC/UTCD	4
Anthropocene	4	RVRC/UTCP course 4 (replaces ES2631)	4
EG2401A Engineering Professionalism	2	Elective 3 for Second Major	4
RVRC/UTCP course 3 (replaces CDE2501)	4	UE	4
Elective 2 for Second Major (from List I)	4	UE	2
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total Sub-total	28	Sub-total 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	6	CDE4301 Innovation & Design Capstone	6
or CDE4301A Ideas to Start-up	U	or CDE4301A Ideas to Start-up	U
ESE3201 Air Quality in Changing	4	Elective 4 for Second Major	4
Environment	4	Elective 4 for Second Major	4
ESE3401 Sustainable Urban Water	4	ESE4408 Environmental Impact	4
Technology	4	Assessment	4
ESE4501 Design Project	4	Technical Elective 2	4
Technical Elective 1	4		
Sub-total Sub-total	22	Sub-total Sub-total	18

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).

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
ESE2101 Environmental Science and	4	ESE2102 Principles and Practice in	4
Engineering Principles and Practice	4	Environmental Monitoring	4
GEA1000 Quantitative Reasoning with	4	ESE3101 Resource Management and	4
Data	4	Circular Economy	4
DTK1234 Design Thinking	4	MA1512 Differential Equations for	2
DIK1254 Design Hilliking		Engineering	
MA1513 Linear Algebra with Differential	2	RVRC/UTCP course 2 (replaces GE)	4
Equations	2	RVRC/OTCP course 2 (replaces GE)	4
CE2407A Uncertainty Analysis for	2	Elective 1 for Second Major (from List I)	4
Engineers	2	Elective 1 for Second Major (from List I)	4
PF1101A Project Management and	4	CDE2201 Ideas to Dreaf of Concept	6
Finance	4	CDE3301 Ideas to Proof-of-Concept	O
RVRC/UTCP course 1 (replaces GE)	4		
Sub-total	24	Sub-total	24

Semester 3	Units	Semester 4 – NOC	Units
CE2134 Fluid Mechanics	4		
ESE2000 Chemistry for An	4		
Environmentally Sustainable Future			
ESE2001 Environmental Challenges in the	4		
Anthropocene	Ť	NOC	
RVRC/UTCP course 3 (replaces CDE2501)	4		
Elective 2 for Second Major (from List I)	4		
CDE3301 Ideas to Proof-of-Concept	6		
UE	2		
Sub-total	28	Sub-total	20

Semester 5	Units	Semester 6	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
or CDE4301A Ideas to Start-up	D	or CDE4301A Ideas to Start-up	0
ESE3201 Air Quality in Changing	4	ESE3301 Microbiology in Natural and	4
Environment	4	Built Environment	4
ESE3401 Sustainable Urban Water	4	ESE4408 Environmental Impact	4
Technology	4	Assessment	4
ESE4501 Design Project	4	Technical Elective 1	4
EE2211 Introduction to Machine			
Learning or EE2213 Introduction to	4	Technical Elective 2	4
Artificial Intelligence			
RVRC/UTCP course 4 (replaces ES2631)	4	UE	4
Sub-total	26	Sub-total	26

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)

Recommended semester schedule – poly-intake students

Semester 1	Units	Semester 2	Units
ESE2101 Environmental Science and	4	ESE2102 Principles and Practice in	4
Engineering Principles and Practice		Environmental Monitoring	4
GEA1000 Quantitative Reasoning with	4	CS1010E Programming Methodology	4
Data			
DTK1234 Design Thinking or PF1101A	4	MA1511 Engineering Calculus	2
Project Management and Finance ^			
MA1301 Introductory Mathematics *	4	MA1512 Differential Equations for	2
(UE)		Engineering	
Elective 1 for Second Major (from List I)	4	CDE3301 Ideas to Proof-of-Concept	6
		Elective 2 for Second Major (from List I)	4
Sub-total Sub-total	20	Sub-total	22

Semester 3	Units	Semester 4	Units
CE2134 Fluid Mechanics	4	ESE3101 Resource Management and	4
		Circular Economy	4
ESE2000 Chemistry for An	4	ESE3301 Microbiology in Natural and	4
Environmentally Sustainable Future		Built Environment	
ESE2001 Environmental Challenges in the	4	EE2211 Introduction to Machine Learning	
		or EE2213 Introduction to Artificial	4
Anthropocene		Intelligence	
MA1513 Linear Algebra with Differential	2	ES2631 Critique and Communication of	4
Equations *		Thinking and Design	
CE2407A Uncertainty Analysis for	2	GF	4
Engineers *		GE	4
EG2401A Engineering Professionalism	2	Elective 3 for Second Major	4
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	24	Sub-total Sub-total	24

Semester 5	Units	Semester 6	Units
CDE4301 Innovation & Design Capstone	6	CDE4301 Innovation & Design Capstone	6
or CDE4301A Ideas to Start-up	U	or CDE4301A Ideas to Start-up	0
ESE3201 Air Quality in Changing	4	Floative 4 for Cocond Major	4
Environment	4	Elective 4 for Second Major	4
ESE3401 Sustainable Urban Water	4	ESE4408 Environmental Impact	4
Technology	4	Assessment	4
ESE4501 Design Project	4	Technical Elective 1	4
CDE2501 Liveable Cities	4	Technical Elective 2	4
GE	4		
Sub-total	26	Sub-total Sub-total	22

 $^{^{*}}$ 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) or PF1101A Project Management and Finance (4 units)
- EG1311BE Design and Make (4 units) can be taken in any semester if not exempted
- EG3611P Industrial Attachment (10 units)
- Unrestricted electives (20 units)