

**Bachelor of Engineering (Computer Engineering)
with Minor in Innovation & Design**

Cohort AY2025/2026

Course Requirements	Units
Common Curriculum	
GEA1000 Quantitative Reasoning with Data ¹	4
CS1010 Programming Methodology (or other variants) ²	4
CDE2501 Sustainable Systems for 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
MA1508E Linear Algebra for Engineering	4
EG2401A Engineering Professionalism	2
EG3611A Industrial Attachment ³ or CFG2101 NUS Vacation Internship Programme ⁴ and EG3612 Vacation Industrial Attachment	10
Sub-total for Engineering Core	20
Engineering Programme Requirements	
CG1111A Engineering Principles and Practice I	4
CG2111A Engineering Principles and Practice II	4
CG2023 Signals and Systems	4
CG2027 Transistor-level Digital Circuits	2
CG2028 Computer Organization	2
CG2271 Real-time Operating Systems	4
CG3201 Machine Learning and Deep Learning	4
CG3207 Computer Architecture	4
CS1231 Discrete Structures	4
CS2040C Data Structures and Algorithms	4
CS2107 Introduction to Information Security	4
CS2113 Software Engineering & Object-Oriented Programming	4
EE2026 Digital Design	4
EE4204 Computer Networks	4
CG4002 Computer Engineering Capstone Project ⁵	8
Sub-total for Engineering Programme Requirements	60
Unrestricted Electives	
CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters) ⁶	12
Electives for Minor ⁶	8
Other unrestricted electives ⁵	20
Sub-total for Unrestricted Electives	40
Total	160

NUS Innovation & Design Programme
College of Design and Engineering

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 Students may read also fulfil the compulsory internship using any combination of the following for a minimum of 10 units (excess units are counted towards unrestricted electives):
 - CP3200 Internship (6 units)
 - CP3202 Internship II (6 units)
 - CP3880 Advanced Technology Research Programme (12 units)
- ⁴ May be replaced by CDE2605 Undergraduate Research Opportunities Programme or CDE2605R Undergraduate Research Experience (UREx).
- ⁵ Students may take CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up in lieu of CG4002 and 4 units of unrestricted electives. They may also take CG4001 B.Eng. Dissertation, CP4106 Computing Project, EE4002D Design Capstone, or EE4002R Research Capstone in lieu of CG4002.
- ⁶ Students should clear at least one elective course prior to CDE3301. Students in competition teams may enrol in CDE3301C Complex Systems Design: From Mission to Prototype in Semester 3 to Semester 4 (Year 2) or Semester 5 to Semester 6 (Year 3).

Sample study plan – JC-intake students or equivalent
(for students who opt for vacation internships)

Semester 1	Units	Semester 2	Units
CG1111A Engineering Principles and Practice I	4	CG2111A Engineering Principles and Practice II	4
CS1010 Programming Methodology	4	CS1231 Discrete Structures	4
EG1311 Design and Make or EG1311BE Design and Make	4	GEA1000 Quantitative Reasoning with Data	4
MA1511 Engineering Calculus	2	DTK1234 Design Thinking	4
MA1512 Differential Equations for Engineering	2	MA1508E Linear Algebra for Engineering	4
GE	4	Elective 1 for Minor	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
CS2040C Data Structures and Algorithms	4	CG2023 Signals and Systems	4
CS2107 Introduction to Information Security	4	CG2271 Real-time Operating Systems	4
EE2026 Digital Design	4	CS2113 Software Engineering & Object-Oriented Programming	4
ES2631 Critique and Communication of Thinking and Design	4	EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4
Elective 2 for Minor	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	CG2027 Transistor-level Digital Circuits	2
EG2401A Engineering Professionalism	2	CG2028 Computer Organization	2
GE	4	CG3201 Machine Learning and Deep Learning	4
UE	4	CDE2501 Sustainable Systems for Liveable Cities	4
UE	4	PF1101A Project Management and Finance	4
Sub-total	20	Sub-total	16

Semester 7	Units	Semester 8	Units
CG4002 Computer Engineering Capstone Project	8	UE	4
CG3207 Computer Architecture	4	UE	4
EE4204 Computer Networks	4	UE	4
Sub-total	16	Sub-total	12

Sample study plan – JC-intake students or equivalent
(for students who opt for industrial attachment)

Semester 1	Units	Semester 2	Units
CG1111A Engineering Principles and Practice I	4	CG2111A Engineering Principles and Practice II	4
CS1010 Programming Methodology	4	CS1231 Discrete Structures	4
EG1311 Design and Make or EG1311BE Design and Make	4	GEA1000 Quantitative Reasoning with Data	4
MA1511 Engineering Calculus	2	DTK1234 Design Thinking	4
MA1512 Differential Equations for Engineering	2	MA1508E Linear Algebra for Engineering	4
GE	4	Elective 1 for Minor	4
Sub-total	20	Sub-total	24

Semester 3	Units	Semester 4	Units
CS2040C Data Structures and Algorithms	4	CG2023 Signals and Systems	4
CS2107 Introduction to Information Security	4	CG2027 Transistor-level Digital Circuits	2
EE2026 Digital Design	4	CG2028 Computer Organization	2
ES2631 Critique and Communication of Thinking and Design	4	CG2271 Real-time Operating Systems	4
Elective 2 for Minor	4	CS2113 Software Engineering & Object-Oriented Programming	4
		EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4
		CDE3301 Ideas to Proof-of-Concept	6
Sub-total	20	Sub-total	26

Semester 5	Units	Semester 6	Units
CDE3301 Ideas to Proof-of-Concept	6	EG3611A Industrial Attachment	10
CDE2501 Sustainable Systems for Liveable Cities	4		
PF1101A Project Management and Finance	4		
EG2401A Engineering Professionalism	2		
GE	4		
Sub-total	20	Sub-total	10

Semester 7	Units	Semester 8	Units
CG4002 Computer Engineering Capstone Project	8	CG3201 Machine Learning and Deep Learning	4
CG3207 Computer Architecture	4	UE	4
EE4204 Computer Networks	4	UE	4
UE	4	UE	4
		UE	4
Sub-total	20	Sub-total	20

Sample study plan – JC-intake students or equivalent
(for students in Engineering Scholars Programme)

Semester 1	Units	Semester 2	Units
CG1111A Engineering Principles and Practice I	4	CG2111A Engineering Principles and Practice II	4
MA1512 Differential Equations for Engineering	2	CS1231 Discrete Structures	4
CS2040C Data Structures and Algorithms	4	GEA1000 Quantitative Reasoning with Data	4
UE	4	DTK1234 Design Thinking	4
RVRC/UTCP course 1 (replaces GE)	4	RVRC/UTCP course 2 (replaces GE)	4
Elective 1 for Minor	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	22	Sub-total	26

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/NOC	Units
CG2027 Transistor-level Digital Circuits	2	CG2023 Signals and Systems	4
CG2028 Computer Organization	2	CG2271 Real-time Operating Systems	4
CS2107 Introduction to Information Security	4	EE2026 Digital Design	4
CS2113 Software Engineering & Object-Oriented Programming	4	EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4
RVRC/UTCP course 3 (replaces CDE2501)	4	RVRC/UTCP course 4 (replaces ES2631)	4
Elective 2 for Minor	4		
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	26	Sub-total	20

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

Semester 5	Units	Semester 6	Units
CG4002 Computer Engineering Capstone Project	8	CG3201 Machine Learning and Deep Learning	4
CG3207 Computer Architecture	4	PF1101A Project Management and Finance	4
EE4204 Computer Networks	4	UE	4
EG2401A Engineering Professionalism	2	UE	4
UE	4	UE	2
Sub-total	22	Sub-total	18

NUS Innovation & Design Programme
College of Design and Engineering

Students are highly encouraged to complete the following courses before Semester 1 through advanced placement credits:

- CS1010 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)
- MA2001 Linear Algebra (4 units) – replaces MA1508E Linear Algebra for Engineering (4 units)

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

Sample study plan – poly-intake students

(for students who may want to upgrade to a Second Major)

Semester 1	Units	Semester 2	Units
CG1111A Engineering Principles and Practice I	4	CG2111A Engineering Principles and Practice II	4
CS1010 Programming Methodology	4	CS1231 Discrete Structures	4
MA1301 Introductory Mathematics * (UE)	4	CS2040C Data Structures and Algorithms	4
PC1201 Fundamentals of Physics ^ (UE)	4	GEA1000 Quantitative Reasoning with Data	4
Elective 1 for Minor	4	MA1508E Linear Algebra for Engineering	4
		CDE3301 Ideas to Proof-of-Concept	6
Sub-total	20	Sub-total	26

Semester 3	Units	Semester 4	Units
CS2107 Introduction to Information Security	4	CG2023 Signals and Systems	4
CS2113 Software Engineering & Object-Oriented Programming	4	CG2027 Transistor-level Digital Circuits	2
EE2026 Digital Design	4	CG2028 Computer Organization	2
ES2631 Critique and Communication of Thinking and Design	4	CG2271 Real-time Operating Systems	4
MA1511 Engineering Calculus *	2	EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4
MA1512 Differential Equations for Engineering *	2	GE ^	4
CDE3301 Ideas to Proof-of-Concept	6	Elective 2 for Minor	4
Sub-total	26	Sub-total	24

Semester 5	Units	Semester 6	Units
CG4002 Computer Engineering Capstone Project	8	CG3201 Machine Learning and Deep Learning	4
CG3207 Computer Architecture	4	EE4204 Computer Networks	4
EG2401A Engineering Professionalism	2	CDE2501 Sustainable Systems for Liveable Cities	4
GE ^	4	PF1101A Project Management and Finance	4
Sub-total	18	Sub-total	16

* Students who are exempted from MA1301 can take MA1511 and MA1512 in Semester 1.

^ Students who are exempted from PC1201 can take a GE 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)

Sample study plan – poly-intake students

(for students who are not planning to upgrade to a Second Major)

Semester 1	Units	Semester 2	Units
CG1111A Engineering Principles and Practice I	4	CG2111A Engineering Principles and Practice II	4
CS1010 Programming Methodology	4	CS1231 Discrete Structures	4
MA1301 Introductory Mathematics * (UE)	4	CS2040C Data Structures and Algorithms	4
PC1201 Fundamentals of Physics ^ (UE)	4	GEA1000 Quantitative Reasoning with Data	4
GE	4	MA1508E Linear Algebra for Engineering	4
		Elective 1 for Minor	4
Sub-total	20	Sub-total	24

Semester 3	Units	Semester 4	Units
CS2107 Introduction to Information Security	4	CG2023 Signals and Systems	4
CS2113 Software Engineering & Object-Oriented Programming	4	CG2027 Transistor-level Digital Circuits	2
EE2026 Digital Design	4	CG2028 Computer Organization	2
ES2631 Critique and Communication of Thinking and Design	4	CG2271 Real-time Operating Systems	4
MA1511 Engineering Calculus *	2	EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4
MA1512 Differential Equations for Engineering *	2	CDE3301 Ideas to Proof-of-Concept	6
Elective 2 for Minor	4		
Sub-total	24	Sub-total	22

Semester 5	Units	Semester 6	Units
CG4002 Computer Engineering Capstone Project	8	CG3201 Machine Learning and Deep Learning	4
CG3207 Computer Architecture	4	EE4204 Computer Networks	4
EG2401A Engineering Professionalism	2	CDE2501 Sustainable Systems for Liveable Cities	4
CDE3301 Ideas to Proof-of-Concept	6	PF1101A Project Management and Finance	4
		GE ^	4
Sub-total	20	Sub-total	20

* Students who are exempted from MA1301 can take MA1511 and MA1512 in Semester 1.

^ Students who are exempted from PC1201 can take a GE 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)