NUS Innovation & Design Programme
College of Design and Engineering

Bachelor of Engineering (Electrical Engineering)
with Minor 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
EE4002D Design Capstone or EE4002R Research Capstone (over 2 consecutive semesters) [4]	8
Sub-total for Common Curriculum	**60**
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 or CFG2101 NUS Vacation Internship Programme [5] and EG3612 Vacation Industrial Attachment	10
Sub-total for Engineering Core	**20**
Engineering Programme Requirements	
EE1111A Electrical Engineering Principles and Practice I	4
EE2111A Electrical Engineering Principles and Practice II	4
EE2012 Analytical Methods in Electrical and Computer Engineering	4
EE2022 Electrical Energy Systems	4
EE2023 Signals and Systems	4
EE2026 Digital Design or EE2028 Microcontroller Programming and Interfacing	4
EE2027 Electronic Circuits	4
PC2020 Electromagnetics for Electrical Engineers	4
Technical electives	8
Sub-total for Engineering Programme Requirements	**40**
Unrestricted Electives	
Group A course for Minor	4
Group B course for Minor	4
CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters)	12
Other unrestricted electives [4]	20
Sub-total for Unrestricted Electives	**40**
Total	**160**

(updated 15 July 2025)

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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   Students may take CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up in lieu of EE4002D/EE4002R and 4 units of unrestricted electives.

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

(updated 15 July 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)

Semester 1	Units	Semester 2	Units
EE1111A Electrical Engineering Principles and Practice I	4	EE2111A Electrical Engineering Principles and Practice II	4
CS1010E Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
EG1311 Design and Make	4	DTK1234 Design Thinking	4
MA1511 Engineering Calculus	2	MA1508E Linear Algebra for Engineering	4
MA1512 Differential Equations for Engineering	2	PF1101 Fundamentals of Project Management	4
GEC/GEN	4	Group A/B course 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
EE2023 Signals and Systems	4	CDE2501 Liveable Cities	4
EE2026 Digital Design or EE2028 Microcontroller Programming and Interfacing	4	EE2027 Electronic Circuits	4
ES2631 Critique and Communication of Thinking and Design	4	EE2211 Introduction to Machine Learning	4
Additional technical course 1	4	Additional technical course 2	4
Group A/B course 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	Additional technical course 3	4
EE2012 Analytical Methods in Electrical and Computer Engineering	4	GEC/GEN	4
EE2022 Electrical Energy Systems	4	UE	4
PC2020 Electromagnetics for Electrical Engineers	4	UE	4
EG2401A Engineering Professionalism	2	UE	4
Sub-total	**20**	**Sub-total**	**20**

Semester 7	Units	Semester 8	Units
EE4002D Design Capstone or EE4002R Research Capstone	4	EE4002D Design Capstone or EE4002R Research Capstone	4
Technical Elective 1	4	Technical Elective 2	4
UE	4	UE	4
Sub-total	**14**	**Sub-total**	**10**

^ Students can only take CDE2310 or CDE2301 in Semester 2. Those who wish to take CDE2300 (in lieu of CDE2310) and CDE2311/CDE2605R/CDE2606B (in lieu of CDE2301) may clear both courses concurrently in Semester 3.

(updated 15 July 2025)

NUS Innovation & Design Programme
College of Design and Engineering

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

Semester 1	Units	Semester 2	Units
EE1111A Electrical Engineering Principles and Practice I	4	EE2111A Electrical Engineering Principles and Practice II	4
CS1010E Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
EG1311 Design and Make	4	DTK1234 Design Thinking	4
MA1511 Engineering Calculus	2	MA1508E Linear Algebra for Engineering	4
MA1512 Differential Equations for Engineering	2	PF1101 Fundamentals of Project Management	4
GEC/GEN	4	Group A/B course for Minor ^	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	Units	Semester 4	Units
EE2023 Signals and Systems	4	CDE2501 Liveable Cities	4
EE2026 Digital Design or EE2028 Microcontroller Programming and Interfacing	4	EE2027 Electronic Circuits	4
ES2631 Critique and Communication of Thinking and Design	4	EE2211 Introduction to Machine Learning	4
Additional technical course 1	4	Additional technical course 2	4
Group A/B course for Minor ^	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
EE2012 Analytical Methods in Electrical and Computer Engineering	4		
EE2022 Electrical Energy Systems	4		
PC2020 Electromagnetics for Electrical Engineers	4		
EG2401A Engineering Professionalism	2		
GEC/GEN	4		
Sub-total	**24**	**Sub-total**	**10**

Semester 7	Units	Semester 8	Units
EE4002D Design Capstone or EE4002R Research Capstone	4	EE4002D Design Capstone or EE4002R Research Capstone	4
Technical Elective 1	4	Technical Elective 2	4
Additional technical course 3	4	UE	4
UE	4	UE	4
UE	4	UE	4
Sub-total	**22**	**Sub-total**	**22**

^ Students can only take CDE2310 or CDE2301 in Semester 2. Those who wish to take CDE2300 (in lieu of CDE2310) and CDE2311/CDE2605R/CDE2606B (in lieu of CDE2301) may clear both courses concurrently in Semester 3.

(updated 15 July 2025)

NUS Innovation & Design Programme
College of Design and Engineering

Recommended semester schedule – JC-intake students or equivalent
(for students in Engineering Scholars Programme)

Semester 1	Units	Semester 2	Units
EE1111A Electrical Engineering Principles and Practice I	4	EE2111A Electrical Engineering Principles and Practice II	4
MA1512 Differential Equations for Engineering	2	EE2023 Signals and Systems	4
UTCP course 1 (replaces GE)	4	GEA1000 Quantitative Reasoning with Data	4
Group B course for Minor	4	DTK1234 Design Thinking	4
UE (or IE2141 Systems Thinking & Dynamics if not in UTCP)	4	UTCP course 2 (replaces GE)	4
UE	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**22**	**Sub-total**	**26**

Semester 3	Units	Semester 4 – NOC	Units
EE2026 Digital Design or EE2028 Microcontroller Programming and Interfacing	4	NOC	
EE2027 Electronic Circuits	4		
EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence	4		
PC2020 Electromagnetics for Electrical Engineers	4		
UTCP course 3 (replaces CDE2501)	4		
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	**26**	**Sub-total**	**20**

Semester 5	Units	Semester 6	Units
EE4002D Design Capstone or EE4002R Research Capstone	4	EE4002D Design Capstone or EE4002R Research Capstone	4
EE2012 Analytical Methods in Electrical and Computer Engineering	4	Additional technical course 1	4
EE2022 Electrical Energy Systems	4	Additional technical course 2	4
UTCP course 4 (replaces ES2631 Critique and Communication of Thinking and Design)	4	PF1101A Project Management and Finance	4
Technical Elective 1	4	Technical Elective 2	4
Group A course for Minor	4	UE	4
UE	2		
Sub-total	**26**	**Sub-total**	**24**

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

(updated 15 July 2025)

NUS Innovation & Design Programme
College of Design and Engineering

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) – counted as UE (4 units)
- Entrepreneurship course (4 units) – counted as UE (4 units)

(updated 15 July 2025)

NUS Innovation & Design Programme
College of Design and Engineering

Recommended semester schedule – poly-intake students
(for students who may want to upgrade to a Second Major)

Semester 1	Units	Semester 2	Units
EE1111A Electrical Engineering Principles and Practice I	4	EE2111A Electrical Engineering Principles and Practice II	4
CS1010E Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
MA1301 Introductory Mathematics * (UE)	4	MA1508E Linear Algebra for Engineering	4
PC1201 Fundamentals of Physics (UE)	4	PF1101 Fundamentals of Project Management	4
Group A/B course for Minor	4	CDE3301 Ideas to Proof-of-Concept	6
		Group A/B course for Minor	4
Sub-total	**20**	**Sub-total**	**26**

Semester 3	Units	Semester 4	Units
MA1511 Engineering Calculus *	2	CDE2501 Liveable Cities	4
MA1512 Differential Equations for Engineering *	2	EE2012 Analytical Methods in Electrical and Computer Engineering	4
EE2022 Electrical Energy Systems	4	EE2023 Signals and Systems	4
EE2026 Digital Design or EE2028 Microcontroller Programming and Interfacing	4	EE2211 Introduction to Machine Learning	4
EE2027 Electronic Circuits	4	PC2020 Electromagnetics for Electrical Engineers	4
ES2631 Critique and Communication of Thinking and Design	4	Additional technical course 1	4
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	**26**	**Sub-total**	**24**

Semester 5	Units	Semester 6	Units
EE4002D Design Capstone or EE4002R Research Capstone	4	EE4002D Design Capstone or EE4002R Research Capstone	4
EG2401A Engineering Professionalism	2	Technical Elective 1	4
Additional technical course 2	4	Technical Elective 2	4
GEC/GEN	4	Additional technical course 3	4
GEC/GEN	4		
Sub-total	**18**	**Sub-total**	**16**

* Students who are exempted from MA1301 can take MA1511 and MA1512 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)
- EG3611A Industrial Attachment (10 units)
- Unrestricted electives (20 units)

(updated 15 July 2025)

NUS Innovation & Design Programme
College of Design and Engineering

Recommended semester schedule – poly-intake students
(for students who are not planning to upgrade to a Second Major)

Semester 1	Units	Semester 2	Units
EE1111A Electrical Engineering Principles and Practice I	4	EE2111A Electrical Engineering Principles and Practice II	4
CS1010E Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
MA1301 Introductory Mathematics * (UE)	4	MA1508E Linear Algebra for Engineering	4
PC1201 Fundamentals of Physics (UE)	4	PF1101 Fundamentals of Project Management	4
GEC/GEN	4	GEC/GEN	4
		Group A/B course for Minor	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	Units	Semester 4	Units
MA1511 Engineering Calculus *	2	CDE2501 Liveable Cities	4
MA1512 Differential Equations for Engineering *	2	EE2012 Analytical Methods in Electrical and Computer Engineering	4
EE2022 Electrical Energy Systems	4	EE2023 Signals and Systems	4
EE2026 Digital Design or EE2028 Microcontroller Programming and Interfacing	4	EE2211 Introduction to Machine Learning	4
EE2027 Electronic Circuits	4	Additional technical course 1	4
ES2631 Critique and Communication of Thinking and Design	4	CDE3301 Ideas to Proof-of-Concept	6
Group A/B course for Minor	4		
Sub-total	**24**	**Sub-total**	**26**

Semester 5	Units	Semester 6	Units
EE4002D Design Capstone or EE4002R Research Capstone	4	EE4002D Design Capstone or EE4002R Research Capstone	4
EG2401A Engineering Professionalism	2	Technical Elective 1	4
PC2020 Electromagnetics for Electrical Engineers	4	Technical Elective 2	4
Additional technical course 2	4	Additional technical course 3	4
CDE3301 Ideas to Proof-of-Concept	6		
Sub-total	**20**	**Sub-total**	**16**

* Students who are exempted from MA1301 can take MA1511 and MA1512 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)
- EG3611A Industrial Attachment (10 units)
- Unrestricted electives (20 units)

(updated 15 July 2025)