Innovation & Design Programme
NUS College of Design and Engineering

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

Cohorts AY2021/2022 and AY2022/2023

Modular Requirements	Modular Credits (MCs)
Common Curriculum	
GEA1000 Quantitative Reasoning with Data	4
CS1010 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
DTK1234 Design Thinking	4
EE2211 Introduction to Machine Learning	4
EG1311 Design and Make	4
EG2501 Liveable Cities	4
IE2141 Systems Thinking and Dynamics	4
PF1101 Fundamentals of Project Management	4
CG4002 Computer Engineering Capstone Project [2]	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 EG2610 Work Experience Internship and EG3612 Vacation Industrial Attachment	10
Sub-total for Engineering Core	**20**
Engineering Programme Requirements	
CG1111 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
CS1231 Discrete Structures	4
CS2040C Data Structures and Algorithms	4
CS2113 Software Engineering & Object-Oriented Programming	4
EE2026 Digital Design	4
EE4204 Computer Networks	4
Sub-total for Engineering Programme Requirements	**40**
Unrestricted Electives	
Group A module for Minor	4
Group B module for Minor	4
EG3301R DCP Project (over 2 consecutive semesters)	12
Other unrestricted electives [2]	20
Sub-total for Unrestricted Electives	**40**
Total	**160**

(updated 14 Oct 2022)

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Notes:

[1] Students may read equivalent modules in USP/NUSC, UTCP, and RVRC.

[2] Subject to approval from home department, students may take EG4301 DCP Dissertation or EG4301A Ideas to Start-up in lieu of CG4002 and 4 MCs of unrestricted electives.

[3] May be replaced by EG2605 Undergraduate Research Opportunities Programme.

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

Semester 1	MCs	Semester 2	MCs
CG1111 Engineering Principles and Practice I	4	CG2111A Engineering Principles and Practice II	4
CS1010 Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
EG1311 Design & 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
GE	4	Group A/B module for Minor ^	4
Sub-total	**20**	**Sub-total**	**24**

Summer vacation between Semesters 2 and 3	MCs
EG2610 Work Experience Internship	4
Sub-total	**4**

Semester 3	MCs	Semester 4	MCs
CS1231 Discrete Structures	4	CG2023 Signals and Systems	4
CS2040C Data Structures and Algorithms	4	CS2113 Software Engineering & Object-Oriented Programming	4
ES2631 Critique and Communication of Thinking and Design	4	EE2026 Digital Design	4
IE2141 Systems Thinking & Dynamics	4	EE2211 Introduction to Machine Learning	4
Group A/B module for Minor	4	EG2501 Liveable Cities	4
		EG3301R DCP Project	6
Sub-total	**20**	**Sub-total**	**26**

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

Semester 5	MCs	Semester 6 – can be used for SEP	MCs
EG3301R DCP Project	6	CG2027 Transistor-level Digital Circuits	2
EG2401A Engineering Professionalism	2	CG2028 Computer Organization	2
GE *	4	CG2271 Real-time Operating Systems	4
GE *	4	CDE2000 Creating Narratives	4
UE	4	UE	4
		UE	4
Sub-total	**20**	**Sub-total**	**20**

Semester 7	MCs	Semester 8	MCs
CG4002 Computer Engineering Capstone Project	8	UE	4
EE4204 Computer Networks	4	UE	4
Sub-total	**12**	**Sub-total**	**8**

^ Students can only take EG2310 or EG2301 in this semester. Those who wish to take EG2201A (in lieu of EG2310) and EG2311/EG2606B (in lieu of EG2301) may clear both modules concurrently in Semester 3.

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

(updated 14 Oct 2022)

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

Semester 1	MCs	Semester 2	MCs
CG1111 Engineering Principles and Practice I	4	CG2111A Engineering Principles and Practice II	4
CS1010 Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
EG1311 Design & 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
GE	4	Group A/B module for Minor ^	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	MCs	Semester 4	MCs
CS1231 Discrete Structures	4	CG2023 Signals and Systems	4
CS2040C Data Structures and Algorithms	4	CS2113 Software Engineering & Object-Oriented Programming	4
ES2631 Critique and Communication of Thinking and Design	4	EE2026 Digital Design	4
IE2141 Systems Thinking & Dynamics	4	EE2211 Introduction to Machine Learning	4
Group A/B module for Minor	4	EG2501 Liveable Cities	4
		EG3301R DCP Project	6
Sub-total	**20**	**Sub-total**	**26**

Semester 5	MCs	Semester 6	MCs
EG3301R DCP Project	6	EG3611A Industrial Attachment	10
EG2401A Engineering Professionalism	2		
CG2027 Transistor-level Digital Circuits	2		
CG2028 Computer Organization	2		
CG2271 Real-time Operating Systems	4		
GE *	4		
Sub-total	**20**	**Sub-total**	**10**

Semester 7	MCs	Semester 8	MCs
CG4002 Computer Engineering Capstone Project	8	UE	4
EE4204 Computer Networks	4	UE	4
GE *	4	UE	4
UE	4	UE	4
		xxxx Creating Narratives	4
Sub-total	**20**	**Sub-total**	**20**

^ Students can only take EG2310 or EG2301 in this semester. Those who wish to take EG2201A (in lieu of EG2310) and EG2311/EG2606B (in lieu of EG2301) may clear both modules concurrently in Semester 3.

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

(updated 14 Oct 2022)

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

Semester 1	MCs	Semester 2	MCs
CG1111 Engineering Principles and Practice I	4	CG2111A Engineering Principles and Practice II	4
CS1231 Discrete Structures	4	GEA1000 Quantitative Reasoning with Data	4
MA1511 Engineering Calculus	2	DTK1234 Design Thinking	4
MA1512 Differential Equations for Engineering	2	PF1101 Fundamentals of Project Management	4
RC4 module 1 (replaces GE)	4	RC4 module 2 (replaces GE)	4
Group B module for Minor	4	EG3301R DCP Project	6
UE	4		
Sub-total	**24**	**Sub-total**	**26**

Semester 3	MCs	Semester 4	MCs
CS2040C Data Structures and Algorithms	4	CG2023 Signals and Systems	4
CG2027 Transistor-level Digital Circuits	2	CS2113 Software Engineering & Object-Oriented Programming	4
CG2028 Computer Organization	2	EE2211 Introduction to Machine Learning	4
EE2026 Digital Design	4	EG2501 Liveable Cities	4
RC4 module 3 (replaces GE)	4	CDE2000 Creating Narratives	4
EG3301R DCP Project	6	RC4 module 4 (ES2631 Critique and Communication of Thinking and Design)	4
Group A module for Minor	4	UE	4
Sub-total	**26**	**Sub-total**	**28**

Semester 5 – NOC	MCs	Semester 6	MCs
NOC		CG4002 Computer Engineering Capstone Project	8
		CG2271 Real-time Operating Systems	4
		EE4204 Computer Networks	4
		UE (or IE2141 Systems Thinking & Dynamics if not in RC4)	4
		UE	4
Sub-total	**20**	**Sub-total**	**24**

Students must complete the following modules before Semester 1 through advanced placement credits:

- CS1010 Programming Methodology (4 MCs)
- MA1508E Linear Algebra for Engineering (4 MCs) – using MA2001 Linear Algebra
- EG1311 Design & Make (4 MCs)

A one-semester NOC programme comprises the following modules:

- TR3202S Start-up Internship Programme (12 MCs) – replaces EG3611A (10 MCs) and EG2401A (2 MCs)
- TR3204 Entrepreneurship Practicum (4 MCs) – counted as UE
- Entrepreneurship course (4 MCs) – counted as UE

Students who are not going on NOC must read EG2101 Pathways to Engineering Leadership in lieu of EG2401A.

(updated 14 Oct 2022)

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

Semester 1	MCs	Semester 2	MCs
CG1111 Engineering Principles and Practice I	4	CG2111A Engineering Principles and Practice II	4
CS1010 Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
MA1511 Engineering Calculus	2	MA1508E Linear Algebra for Engineering	4
MA1512 Differential Equations for Engineering	2	PF1101 Fundamentals of Project Management	4
GE	4	EG3301R DCP Project	6
Group A/B module for Minor ^	4		
Sub-total	**20**	**Sub-total**	**22**

Semester 3	MCs	Semester 4	MCs
CS1231 Discrete Structures	4	CG2023 Signals and Systems	4
CS2040C Data Structures and Algorithms	4	CS2113 Software Engineering & Object-Oriented Programming	4
ES2631 Critique and Communication of Thinking and Design	4	EE2026 Digital Design	4
IE2141 Systems Thinking & Dynamics	4	EE2211 Introduction to Machine Learning	4
Group A/B module for Minor	4	EG2501 Liveable Cities	4
EG3301R DCP Project	6		
Sub-total	**26**	**Sub-total**	**20**

Semester 5	MCs	Semester 6	MCs
CG4002 Computer Engineering Capstone Project	8	GE *	4
CG2027 Transistor-level Digital Circuits	2	GE *	4
CG2028 Computer Organization	2	CDE2000 Creating Narratives	4
CG2271 Real-time Operating Systems	4	EG2401A Engineering Professionalism	2
EE4204 Computer Networks	4		
Sub-total	**20**	**Sub-total**	**14**

^ Students are recommended to take EG2201A in this semester. Those who wish to take EG2310 (in lieu of EG2201A) should take EG2301/EG2311/EG2606B in Semester 1 and EG2310 in Semester 2.

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

Poly-intake students with accredited diplomas will receive the following exemptions:

- DTK1234 Design Thinking (4 MCs)
- EG1311 Design & Make (4 MCs)
- EG3611A Industrial Attachment (10 MCs)
- Unrestricted elective modules (20 MCs)

(updated 14 Oct 2022)

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

Semester 1	MCs	Semester 2	MCs
CG1111 Engineering Principles and Practice I	4	CG2111A Engineering Principles and Practice II	4
CS1010 Programming Methodology	4	GEA1000 Quantitative Reasoning with Data	4
MA1511 Engineering Calculus	2	MA1508E Linear Algebra for Engineering	4
MA1512 Differential Equations for Engineering	2	PF1101 Fundamentals of Project Management	4
GE	4	Group A module for Minor	4
GE	4		
Sub-total	**20**	**Sub-total**	**20**

Semester 3	MCs	Semester 4	MCs
CS1231 Discrete Structures	4	CG2023 Signals and Systems	4
CS2040C Data Structures and Algorithms	4	CS2113 Software Engineering & Object-Oriented Programming	4
ES2631 Critique and Communication of Thinking and Design	4	EE2026 Digital Design	4
IE2141 Systems Thinking & Dynamics	4	EG2501 Liveable Cities	4
Group B module for Minor	4	EG3301R DCP Project	6
Sub-total	**20**	**Sub-total**	**22**

Semester 5	MCs	Semester 6	MCs
CG2027 Transistor-level Digital Circuits	2	CG4002 Computer Engineering Capstone Project	8
CG2028 Computer Organization	2	EE2211 Introduction to Machine Learning	4
CG2271 Real-time Operating Systems	4	EG2401A Engineering Professionalism	2
EE4204 Computer Networks	4	CDE2000 Creating Narratives	4
GE	4		
EG3301R DCP Project	6		
Sub-total	**22**	**Sub-total**	**18**

Poly-intake students with accredited diplomas will receive the following exemptions:

- DTK1234 Design Thinking (4 MCs)
- EG1311 Design & Make (4 MCs)
- EG3611A Industrial Attachment (10 MCs)
- Unrestricted elective modules (20 MCs)

(updated 14 Oct 2022)