Bachelor of Engineering (Industrial & Systems Engineering)
Degree Requirements for Students Matriculated in AY2022/2023 to AY2024/2025

MODULAR REQUIREMENTS	Units
COMMON CURRICULUM REQUIREMENTS - see Annex A	**56**
General Education (GE) Requirements	20
Singapore Studies (GESS)	4
Cultures and Connections (GEC)	4
Communities and Engagement (GEN)	4
CS1010E Programming Methodology	4
ES2631 Critique and Communication of Thinking and Design	4
Common Courses Requirements	36
DTK1234 Design Thinking	4
EG1311 Design and Make or EG1311BE Design and Make	4
IE2141 Systems Thinking and Dynamics	4
EE2211 Introduction to Machine Learning or EE2213 Intriduction to Artificial Intelligence	4
EG2501/CDE2501 Liveable Cities [4]	4
CDE2000 Creating Narratives [4]	4
PF1101 Fundamentals of Project Management or PF1101A Project Management and Finance	4
IE3100R Systems Design Project	8
ISE MAJOR REQUIREMENTS	**60**
Engineering Core	20
MA1511 Engineering Calculus	2
MA1512 Differential Equations for Engineering	2
MA1508E Linear Algebra for Engineering	4
EG2401A Engineering Professionalism[1]	2
EG3611A Industrial Attachment[2] (or equivalent)	10
ISE Major	40
IE1111R Industrial & Systems Engineering Principles & Practice I [3]	4
IE2111 Industrial & Systems Engineering Principles & Practice II	4
IE2100 Probability Models with Applications	4
IE2110 Operations Research I	4
IE3101 Statistics for Engineering Applications	4
IE3110R Simulation	4
CS2040/CS2040DE Data Structures and Algorithms	4
ST2334 Probability and Statistics	4
ISE Technical Electives – see Annex B	8
UNRESTRICTED ELECTIVES (UE) REQUIREMENTS	**44**
Build Your Own Degree	
TOTAL	**160**

[1] Students enrolled in the Engineering Scholars Programme will read EG2101 Pathways to Engineering Leadership instead.

[2] Engineering students may take up to 20 Units of credit-bearing internships, of which up to 10 Units can be used to fulfil the major internship requirement and the remaining will be counted towards Unrestricted Electives. This limit does not apply to students enrolled in the co-op degree programme.

[3] IE1111R is double counted to fulfill both the ISE major requirements and data literacy pillar in GE. ISE students will need to read an additional 4 Units of UE to meet the minimum 160 Units graduation requirements.

[4] Depending on your year of matriculation and normal programme duration, you are required to read one, two or three additional Technical Courses (TC) to meet the revised graduation requirements, with effect from AY2025/2026 Semester 1.
Technical courses may be taken in lieu of Sustainable Futures and/or Creating Narratives pillars. Please refer to CDE website for more details:
https://cde.nus.edu.sg/undergraduate/curriculum-structure

Students should not read more than 60 Units of level 1000 courses towards their degree requirements.

Annex A: Catalogue of Courses in the Common Curriculum

	BEng.
Common Curriculum Pillar	**Basket of Courses**[5]
Singapore Studies	Students may read any course from the curated list of courses as approved by the NUS General Education Committee for this pillar. (Students who have not completed GESS by AY2024/2025, should read CDE2501 as GESS)
Cultures and Connections	Students may read any course from the curated list of courses as approved by the NUS General Education Committee for this pillar.
Communities and Engagement	Students may read any course from the curated list of courses as approved by the NUS General Education Committee for this pillar.
Critique and Expression	ES2631 Critique and Communication of Thinking and Design
Digital Literacy	CS1010% Programming Methodology (any variant)
Data Literacy	IE1111R Industrial & Systems Engineering Principles & Practice I[3]
Design Thinking	DTK1234 Design Thinking
Maker Space	EG1311/EG1311BE Design and Make
Systems Thinking	IE2141 Systems Thinking and Dynamics
Artificial Intelligence	EE2211 Introduction to Machine Learning
Sustainable Futures [4]	EG2501/CDE2501 Liveable Cities
Creating Narratives [4]	CDE2000 Creating Narratives
Project Management	PF1101 Fundamentals of Project Management or PF1101A Project Management and Finance
Integrated Project	Complete 8 Units from the following list of courses: • IE3100R Systems Design Project • XFE4401 Integrated Honours Project • CDE4301 DCP Dissertation[6] • CDE4301A Ideas to Start-up[6]

[5] The listing of courses is expected to grow and evolve over time, to suit curricular needs.

[6] CDE4301 is a 12-Unit course that forms part of the Innovation and Design Second Major. Students taking this will fulfil the Integrated Project pillar (8 Units) and an additional 4 Units of Unrestricted Electives.

Annex B

List of Technical Electives[5]
IE3103 Foundations of Analytics and Decision Intelligence (for Cohorts AY2023/2024 to 2026/2027)
IE3105 Fundamentals of Systems Engineering and Architecture
IE3120 Manufacturing Logistics
IE4100R BEng Dissertation (8 Units)
IE4108 Analytics for E-Commerce
IE4210 Operations Research II
IE4211 Modelling and Analytics
IE4213 Learning from Data
IE4214 Revenue Management and Pricing Analytics
IE4215 Machine Learning for Industrial Engineering
IE4220 Supply Chain Modeling
IE4221 Transportation Demand Modelling and Economics
IE4229 Selected Topics in Logistics
IE4239 Selected Topics in Quality Engineering
IE4242 Cost Analysis and Management
IE4243 Decision Modeling and Risk Analysis
IE4246 Decarbonisation: Principles, Metrics and Cases
IE4248 Energy and Green Economy
IE4259 Selected Topics in Systems Engineering
IE4280 Generative AI and Web3 in Industrial Engineering
IE4299 Selected Topics in Industrial Engineering
CS2103 Software Engineering
IE5108 Facility Layout and Location
IE5121 Quality Planning and Management
IE5202 Applied Forecasting Methods
IE5205 Healthcare Systems and Analytics
IE5206 Energy and Sustainability: A Systems Approach
IE5207 Energy Systems Modelling and Market Mechanisms
IE5208 Systems Approach to Project Management
IE5213 Service Innovation and Management
IE5221 Transportation Modeling and Economics
IE5231 Statistical Methods for Process Design and Control
IE5301 Human Factors in Engineering & Design
IE5603 Statistical Learning in Engineering II
IE5604 Practical Deep Learning Methods for Decision Making
MT5023 Technology Based Entrepreneurial Strategy

Only ISE4 students with GPA ≥ 3.5 are allowed to read level-5000 courses. A maximum of three level-5000 courses (12 Units) are allowed to count towards Major Requirements.