

**Bachelor of Engineering (Industrial & Systems Engineering)
Degree Requirements for Students Matriculated in AY2021/2022 Onwards**

| 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 | 4 |
| IE2141 Systems Thinking and Dynamics | 4 |
| EE2211 Introduction to Machine Learning | 4 |
| EG2501/CDE2501 Liveable Cities | 4 |
| CDE2000 Creating Narratives | 4 |
| PF1101 Fundamentals of Project Management | 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 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.

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^[4] |
| Singapore Studies | Students may read any course from the curated list of courses as approved by the NUS General Education Committee for this pillar. |
| 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 Design and Make |
| Systems Thinking | IE2141 Systems Thinking and Dynamics |
| Artificial Intelligence | EE2211 Introduction to Machine Learning |
| Sustainable Futures | EG2501 Liveable Cities (recoded to CDE2501 wef Semester 1 AY2023/2024) |
| Creating Narratives | CDE2000 Creating Narratives |
| Project Management | PF1101 Fundamentals of Project Management |
| Integrated Project | Complete 8 Units from the following list of courses: <ul style="list-style-type: none"> • IE3100R Systems Design Project • XFE4401 Integrated Honours Project • EG4301 DCP Dissertation^[5] • EG4301A Ideas to Start-up^[5] |

^[4] The listing of courses is expected to grow and evolve over time, to suit curricular needs.

^[5] EG4301 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^[4]

IE3105 Fundamentals of Systems Engineering and Architecture
IE3120 Manufacturing Logistics
IE4100R BEng Dissertation (8 Units)
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
IE5401 [Modern Supply Chain and Blockchain Technologies](#)
MT5023 Technology Based Entrepreneurial Strategy

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