Bachelor of Engineering

(Environmental and Sustainability Engineering) (Hons)

**(Cohort AY2024/25)**

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| --- | --- |
| **NEW CURRICULUM REQUIREMENTS**  | **UNIT** |
| **COMMON CURRICULUM REQUIREMENTS – refer to Table 1** | **60** |
| Singapore Studies (GE)  | 4 |
| Cultures and Connections (GE)  | 4 |
| Communities and Engagement (GE)  | 4 |
| Critique and Expression (GE) - ES2631 Critical Thinking and Writing | 4 |
| Digital Literacy (GE) - CS1010% Programming Methodology  | 4 |
| Data Literacy (GE) - GEA1000 Quantitative Reasoning with Data | 4 |
| Design Thinking - DTK1234 Design Thinking | 4 |
| Maker Space - EG1311 Design and Make | 4 |
| Systems Thinking - IE2141 Systems Thinking and Dynamics | 4 |
| Artificial Intelligence - EE2211 Introduction to Machine Learning | 4 |
| Sustainable Futures – CDE2501 Liveable Cities | 4 |
| Creating Narratives – CDE2000 Creating Narratives | 4 |
| Project Management - PF1101 Fundamentals of Project Management | 4 |
| Integrated Project – **ESE4502R B. Eng. Dissertation or ESE4501R Design Project** | 8 |
| **MAJOR REQUIREMENTS** | **60** |
| **Engineering Core** | **20** |
| MA1511 Engineering Calculus | 2 |
| MA1512 Differential Equations for Engineering | 2 |
| MA1513 Linear Algebra with Differential Equations | 2 |
| CE2407A Uncertainty analysis for Engineers | 2 |
| EG2401A Engineering Professionalism[[1]](#footnote-1) | 2 |
| EG3611A Industrial Attachment[[2]](#footnote-2) (or equivalent) | 10 |
| **Major Programme** | **40** |
| ESE2101 Environmental Engineering Principles & Practices | 4 |
| ESE2102 Principles & Practice in Environmental Monitoring | 4 |
| ESE2000 Chemistry for An Environmentally Sustainable Future | 4 |
| ESE2001 Environmental Challenges in the Anthropocene | 4 |
| ESE3101 Resource Management and Circular Economy | 4 |
| ESE3201 Air Quality in Changing Environment | 4 |
| ESE3301 Microbiology in Natural and Built Environment | 4 |
| ESE3401 Sustainable Urban Water Technology | 4 |
| Technical Electives | 8 |
| **UNRESTRICTED ELECTIVES \*** | **40** |
| **TOTAL** | **160** |

\* *you can take any module that is open to you in ModReg – you may be used to fulfil requirements for Specialisation, Minor or 2nd Major.*

**Catalogue of modules in the Common Curriculum**

Table 1

|  |  |
| --- | --- |
|  | **B.Eng.** |
| **Common Curriculum Pillar** | **Basket of Modules[[3]](#footnote-3)** |
| Singapore Studies (GESS) | Students may read any module from the curated list of modules as approved by the NUS General Education Committee for this pillar. |
| Cultures and Connections (GEC) | Students may read any module from the curated list of modules as approved by the NUS General Education Committee for this pillar. |
| Communities and Engagement (GEN) | Students may read any module from the curated list of modules as approved by the NUS General Education Committee for this pillar. |
| Critique and Expression (GE) | ES2631 Critical Thinking and Writing |
| Digital Literacy (GE) | CS1010% Programming Methodology (any variant) |
| Data Literacy (GE) | GEA1000 Quantitative Reasoning with Data |
| 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 | CDE2501 Liveable Cities |
| Creating Narratives | CDE2000 Creating Narratives |
| Project Management | PF1101 Fundamentals of Project Management |
| Integrated Project | Complete 8 UNIT from the following list of modules:* ESE4502R B. Eng. Dissertation
* ESE4501R Design Project
* XFE4401 Integrated Honours Project
* EG4301 DCP Dissertation[[4]](#footnote-4)
* EG4301A Ideas to Start-up4
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Please note the latest change/update:

The graduation requirements for in-flight students from cohorts AY2022/2023, AY2023/2024, and AY2024/2025 has been revised to include a minimum number of additional technical courses (TC). The minimum number of additional technical courses students are required to read is based on year of matriculation and the normal programme duration (NPD):

Cohorts

AY2022/2023 (A-level & equivalent only) - take 1 TC

AY2023/2024 (A-level & equivalent) & AY2024/2025 (Poly direct-entry) - take 2 TCs

AY2024/2025 (A-level & equivalent only) - take 3 TCs

The basket of additional technical courses for CVE students comprises

• CE2134: Fluid Mechanics

•ESE4408: Environment Impact Assessment

•ESE4501: Design Project *(available from every Semester 1 of AY2026/27 onwards)*

Please refer to the important notice at <https://cde.nus.edu.sg/undergraduate/curriculum-structure/> for more details.

If you do not have sufficient space in these three pillars you will need to use your Unrestricted Electives to read the additional technical courses. You may refer to CDE website for more detail.

|  |
| --- |
| **List of Technical Elective modules:**  |
| * ESE3011 Integrated Project for Environmental Sustainability
* ESE4401 Water and Wastewater Engineering 2
* ESE4403 Membrane Tech in Env. Applns.
* ESE4404 Bioenergy
* ESE4405 Urban Water Engineering and Management
* ESE4406 Energy Systems and Climate Change Mitigation
* ESE4408 Env. Impact Assessment
 | * ESE5880A Topics in Environmental Engineering: Chem. Lab Safety
* ESE5880B Climate Change and Urban Ecosystems
* CE2134 Fluid Mechanics
* CE3132 Hydrology and Free Surface Flows
* CE5315 Climate Science for Engineers
* CE5809 Management and Economics of International Construction
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***Information is correct as ~~January 2024~~ June 2025***

**Recommended Semester Schedule for A-level Students**

|  |  |  |  |
| --- | --- | --- | --- |
| **Semester 1**  |   | **Semester 2**  |  |
| GEA1000 Quantitative Reasoning with Data | 4 | CS1010E Programming Methodology | 4 |
| DTK1234 Design Thinking  | 4 | EG1311 Design and Make | 4 |
| MA1513 Linear Algebra with Differential Equations  | 2 | **UE** (Physics bridging PC1201 for students without A-level Physics) | 4 |
| ESE2101 Environmental Engineering Principles & Practices | 4 | MA1511 Engineering Calculus | 2 |
| PF1101 Fundamentals of Project Management | 4 | MA1512 Differential Equations for Engineering | 2 |
| CE2407A Engineering Uncertainty Analysis  | 2 | ESE2102 Principles & Practice in Environmental Monitoring | 4 |
| **Sub-total**  | 20 | **Sub-total**  | 20 |
| **Semester 3**  |  | **Semester 4**  |  |
| CDE2501 Liveable Cities | 4 | ES2631 Critical Thinking and Writing | 4 |
| EE2211 Introduction to Machine Learning | 4 | IE2141 Systems Thinking and Dynamics | 4 |
| ESE2001 Environmental Challenges in the Anthropocene | 4 | ESE3101 Resource Management and Circular Economy | 4 |
| ESE2000 Chemistry for An Environmentally Sustainable Future | 4 | ESE3301 Microbiology in Natural and Built Environment | 4 |
| EG2401A Engineering Professionalism | 2 | GE | 4 |
| GE | 4 |  |  |
| **Sub-total**  | 22 | **Sub-total**  | 20 |
| **Semester 5** |  | **Semester 6**  |  |
| ESE3201 Air Quality in Changing Environment | 4 | EG3611A Industrial Attachment | 10 |
| ESE3401 Sustainable Urban Water Technology | 4 | Technical Elective | 4 |
| GE  | 4 | **UE** | 4 |
| **UE**  | 4 |  |  |
| **UE** | 4 |  |  |
| **Sub-total**  | 20 | **Sub-total**  | 18 |
| **Semester 7**  |  | **Semester 8**  |  |
| ESE4502R B. Eng. Dissertation, orESE4501R Design Project  | 4 | ESE4502R B. Eng. Dissertation, orESE4501R Design Project[continuation] | 4 |
| CDE2000 Creating Narratives | 4 | **UE** | 4 |
| Technical Elective | 4 | **UE** | 4 |
|  **UE** | 4 | **UE** | 4 |
| **UE** | 4 | **UE** | 4 |
| **Sub-total**  | 20 | **Sub-total**  | 20 |

Note: UE and GE can be taken in any semester.

**Recommended Semester Schedule for Poly Direct-Entry Students**

Regardless of engineering course, all freshmen with a polytechnic diploma will be granted the following APCs from Admit Year 2024/25:

* Unrestricted Elective Modules: 20 UNITs
* EG3611P Industrial Attachment: 10 UNITs
* EG1311 Design and Make: 4 UNITs
* DTK1234 Design Thinking: 4 UNITs

**Total: 38 UNITs**

*For all other diplomas not mentioned below.*

* Unrestricted Electives: 20 UNITs
* EG3611P Industrial Attachment: 10 UNITs
* CDE2000 Creating Narratives: 4 UNITs
* PF1101 Fundamentals of Project Management: 4 UNITs

**Total: 38 UNITs**

*For these diplomas: Hotel and Leisure Facilities Management, NP; Real Estate Business, NP; Facilities Management, SP; Hotel and Leisure Facilities Management, SP; Integrated Events and Project Management, SP; Aviation Management, TP; Aviation Management & Services, TP; Integrated Facility Management, TP.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Semester 1**  |   | **Semester 2**  |  |
| GEA1000 Quantitative Reasoning with Data | 4 | CS1010E Programming Methodology | 4 |
| GE | 4 | GE | 4 |
| MA1301 Introductory Mathematics - *fulfil UE requirement* | 4 | GE | 4 |
| ESE2101 Environmental Engineering Principles & Practices | 4 | MA1511 Engineering Calculus | 2 |
| PF1101 Fundamentals of Project Management | 4 | MA1512 Differential Equations for Engineering | 2 |
|  |  | ESE2102 Principles & Practice in Environmental Monitoring | 4 |
| **Sub-total**  | 20 | **Sub-total**  | 20 |
| **Semester 3**  |  | **Semester 4**  |  |
| CDE2501 Liveable Cities | 4 | ES2631 Critical Thinking and Writing | 4 |
| MA1513 Linear Algebra with Differential Equations | 2 | IE2141 Systems Thinking and Dynamics | 4 |
| CE2407A Engineering Uncertainty Analysis  | 2 | ESE3101 Resource Management and Circular Economy | 4 |
| ESE2001 Environmental Challenges in the Anthropocene | 4 | ESE3301 Microbiology in Natural and Built Environment | 4 |
| ESE2000 Chemistry for An Environmentally Sustainable Future | 4 | UE | 4 |
| EG2401A Engineering Professionalism | 2 |  |  |
| UE | 4 |  |  |
| **Sub-total**  | 22 | **Sub-total**  | 20 |
| **Semester 5** |  | **Semester 6**  |  |
| ESE3201 Air Quality in Changing Environment | 4 | ESE4502R B. Eng. Dissertation, orESE4501R Design Project*[continuation*] | 4 |
| ESE3401 Sustainable Urban Water Technology | 4 | Technical Elective modules | 8 |
| CDE2000 Creating Narratives | 4 | UE | 4 |
| EE2211 Introduction to Machine Learning | 4 | UE | 4 |
| ESE4502R B. Eng. Dissertation, orESE4501R Design Project | 4 |  |  |
| **Sub-total**  | 20 | **Sub-total**  | 20 |

Note: UE *(4 excluding MA1301 and if exempted from bridging math, 5)* and GE can be taken in any semester.

1. Students enrolled in the Engineering Scholars Programme will read EG2101 Pathways to Engineering Leadership instead. [↑](#footnote-ref-1)
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. [↑](#footnote-ref-2)
3. The listing of modules is expected to grow and evolve over time, to suit curricular needs. [↑](#footnote-ref-3)
4. EG4301 is a 12 UNITs module 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. [↑](#footnote-ref-4)