

B.Eng. (Environmental Engineering) Degree Requirement **- matriculating August 2020**

In order to graduate with the B.Eng. (Environmental) degree, students are required to:

- Complete a minimum of 160 MCs with a CAP ≥ 2.0
- Pass the modules in accordance with **Table A**.
- Pass Pathway technical elective modules.
- Students must not read more than 60 MCs of Level-1000 modules towards their degree requirements (excluding CFG1010 Roots and Wings – Personal and Interpersonal Effectiveness 1.0 (2 MCs), ES1103 English for Academic Purposes (4 MCs)) and Modules under the Design-Your-Own-Module (DYOM) initiative.
- Satisfy all other requirements as prescribed by the Faculty or the University.

B.Eng. (Environmental) Degree Requirements

2020 EVE Requirements	
University Requirements	20
General Education (GE) (5 Modules, each of 4MCs)	
<ul style="list-style-type: none"> • Human and Cultures (GEH) • Quantitative Reasoning (GER) • Thinking and Expression (GET) • Singapore Studies (GES) • Asking Questions (GEQ) 	
Faculty Requirements	6
EG2401A Engineering Professionalism	2
ES2531 Critical Thinking and Writing	4
Foundational / Common Requirements	32
MA1511 Engineering Calculus	2
MA1513 Linear Algebra with Differential Equations	2
CE1101A Civil Engineering Principles & Practice	4
ESE2101 Principles & Practice in Infrastructure and Environment	4
* EG1311 Design and Make	4
* CS1010E Programming Methodology	4
* EE2211 Introduction to Machine Learning	4
* MLE1010 Materials Engineering Principles & Practice	4
* IE2141 Systems Thinking & Dynamics	4
<i>* New Common Core Module</i>	
EV Core Modules	32
CE2134 Hydraulics	4
ESE2000 Environmental Engineering Fundamentals	4
ESE2001 Environmental Challenges in the Anthropocene	4
ESE2401 Water Science & Technology	4
ESE3101 Solid and Hazardous Waste Management	4
ESE3201 Air Quality Management	4
ESE3301 Environmental Microbiological Principles	4
ESE3401 Sustainable Urban Water Technology	4
EV Design Project & Internship Modules	22
ESE4501 Design Project	4
ESE4502R B.Eng. Dissertation	8
EG3611A Industrial Attachment	10
EV Technical Electives	8
Pathway Requirements	8
Unrestricted Elective Modules	32
Total MC:	160

¹ BEng students are required to read ES1531 Critical Thinking & Writing. Alternatively, students can read ES1501X Academic Expository Writing. USP/UTRP/RVRC students should refer to their respective programmes for USP/UTRP/RVRC modules to be read in place of ES2531.

² Students who have not passed or been exempted from the Qualifying English Test at the time of admission to the Faculty will have to read ES1000 and/or ES1103. This will be decided by CELC. ES1000 carries zero (0) MCs but students will have to pass in order to graduate while ES1103 carries 4 MCs to be used to fulfil the UEMs.

³ For BEng students who are from direct poly intake and in the following special programmes: DDPs, CDPs, E-Scholar & CSP, industrial attachment is optional and the modular credits for the industrial attachment will become 'Free Electives' i.e., Unrestricted Electives (UE).

Please visit CEE website for more details <https://www.eng.nus.edu.sg/cee/undergraduate/beng-environmental/> for details.

Technical Elective Modules

Department of Civil and Environmental Engineering

ESE3011 Integrated Project for Environmental Sustainability

ESE4301 Wastewater Biotechnology

ESE4401 Water & Wastewater Engineering 2

ESE4403 Membrane Tech in Env. Applns.

ESE4404 Bioenergy

ESE4405 Urban Water Engineering & Management

ESE4406 Energy and the Environment

ESE4407 Environmental Forensics

ESE4408 Environmental Impact Assessment

ESE4409 Environmental Applications of Adsorption

ESE5880A Topics in Environmental Engineering: Chem. Lab Safety

CE3102 Engineering of Socio-Technical System

CE5307A Ocean Waves

CE5307C Finite Amplitude Wave Theories & Their Applications

CE5310 Hydroinformatics

CE5312 River Mechanics

CE5883A Topics in Hydraulic & Water Resources

OT5401 Geoscience for Petroleum Exploration

OT5402 Geophysical Imaging of the Earth Interior

OT5403 Petrophysics and Downhole Measurements

OT5404 Reservoir Characterization and Rock Physics

OT5408 Unconventional and Renewable Energy Resources

* CEE reserves the right to decide on the modules to be offered in any given semester.

Dept of Chemical and Biomolecular Engineering

SH5002 Fundamentals in Industrial Safety

SH5110 Chemical Hazard Evaluation

SH5101 Industrial Toxicology

SH5402 Advanced SHE Management

Professional Pathway Modules/ Research Pathway Modules

Denote by the highlighted colour

Practicing Professional Pathway (PPP)

Sample Semester Schedule for A-Level & Equivalent EVE students

Semester 1	MC	Semester 2	MC
ESE2000 Env. Engr. Fundamentals	4	CS1010E Programming Methodology	4
CE1101A Civil Engineering Principles & Practice	4	ESE2102 Principles & Practice in Infrastructure and Environment	4
MA1511 Engineering Calculus	2	EG1311 Design and Make	4
GER1000 ^{GE 1}	4	GEQ1000 ^{GE 3}	4
GE 2	4	GE 4	4
UEM 1	4	MA1513 Linear Algebra with Differential Equations	2
Sub-total	22	Sub-total	22

Note: These modules are on fully E-Learning

Semester 3	MC	Semester 4	MC
IE2141 System Thinking and Dynamics	4	ESE2401 Water Science & Technology	4
MLE1010 Materials Engineering Principles and Practice	4	ESE3101 Solid and Hazardous Waste Mgmt	4
ESE2001 Environmental Challenges in the Anthropocene	4	ESE3301 Environmental Microbiological Principles	4
CE2134 Hydraulics	4	EE2211 Introduction to Machine Learning	4
ES2531 Critical Thinking and Writing	4	GE 5	4
Sub-total	20	Sub-total	20

Semester 5	MC	Semester 6	MC
ESE3201 Air Quality Management	4	EG3611A Industrial Attachment	10
ESE3401 Sustainable Urban Water Technology	4		
UEM 2	4		
UEM 3	4		
UEM 4	4		
Sub-total	20	Sub-total	10
Special Semester			
UEM 5 *	4		
UEM 6 *	4		
Sub-total	8		

* Can either take them in Special Term or in normal semester on top of the 20/18 MCs

Semester 7	MC	Semester 8	MC
ESE4502R B.Eng. Dissertation	4	ESE4502R B.Eng. Dissertation	4
ESE4501 Design Project	4	Professional Development Module ³	4
Professional Development Module ³	4	UEM 8	4
UEM 7	4	Technical Elective 2	4
Technical Elective 1	4	EG2401A Engineering Professionalism	2
Sub-total	20	Sub-total	18
TOTAL			160

¹Students are strongly encouraged to complete all the five GE modules latest by the end of Year 2.

²UEM can be read in any semester and can be any module out of your major requirements.

³PPP students will have to take 8 MCs of professional development electives to satisfy pathway requirements.

Pre-allocate

Innovation & Design Centric Programme (iDCP)

Recommended schedule to check with iDCP

Accredited Poly Direct Entry EVE Students as of AY2020/2021

EXEMPTED MODULES		MCs
	Unrestricted Elective Module 1 ▪	4
	Unrestricted Elective Module 2 ▪	4
	Unrestricted Elective Module 3 ▪	4
	Unrestricted Elective Module 4 ▪	4
	Unrestricted Elective Module 5 ▪	4
ESE2000	Environmental Engineering Fundamentals *	4
ESE2102	Principles & Practice in Infrastructure and Environment *	4
EG1311	Design and Make *	4
ES1531	Critical Thinking and Writing ˇ	4
Total		36

Polytechnic diploma holders may be granted advanced placement credits (APC) in relevant modules for up to a maximum of 40 MCs (Modular Credits).

- University Level Requirements
- ˇ Faculty Requirements
- * Programme Requirements (*depending on the Diploma*)

Note:

- Table above shows the maximum APCs given by the University and the Faculty/Department. **APCs given to each Accredited Diplomas, can vary.**
- Polytechnic graduates admitted into BEng programmes with the 6-month **(10 MC) Industrial Attachment** requirement, may take the 3-month internship (6MC via EG3602) and/or **'Free Elective' modules** in lieu of the 10 MC for the Industrial Attachment.
- Polytechnic graduates have to read MA1301 except those who have successfully completed all modules/courses in special Math programmes (such as the "Certificate in Engineering Mathematics", "Diploma Plus Programme in Advanced Engineering Mathematics" & etc) offered by their respective Polytechnics. Students can send their certificates to FoE Undergraduate Office for exempted from MA1301, before registering for MA1511/MA1512.
- **Students should not read more than 60 MCs of Level-1000 modules towards their degree requirements** (minimum of 160 MCs for graduation), excluding CFG1010 Roots and Wings – Personal and Interpersonal Effectiveness 1.0 (2 MCs), ES1103 English for Academic Purposes (4 MCs), Modules under the Design-Your-Own-Module (DYOM) initiative. For Polytechnic graduates, 12 MCs of the exempted UE modules will not count towards the 60 MCs limit on level-1000 modules.

Sample Semester Schedule for Accredited Direct Poly Entry EVE students

Semester 3	MC	Semester 4	MC
MA1301 Introductory Mathematics (fulfil UEM 1)	4	ESE2401 Water Science & Technology	4
CE1101A Civil Engineering Principles & Practice	4	MA1511 Engineering Calculus	2
ESE2001 Environmental Challenges in the Anthropocene	4	MA1513 Linear Algebra with Differential Equations	2
CS1010E Programming Methodology	4	GER1000 ^{GE 1}	4
MLE1010 Materials Engineering Principles and Practice	4	GEQ1000 ^{GE 2}	2
		UEM1	2
Sub-total	20	Sub-total	20

- 1) Noted: If exempted from taking MA1301, please proceed to take MA1511 & a UEM (of 4 MCs) in Semester 3 [Total 22 MCs] and MA1513 & GE4 in Semester 4 [Total 22 MCs]
- 2) Semester 3: **These modules are on full e-Learning.** ESE2001 – lecture: E-Learning; tutorial: E-Learning/ F2F; lab: F2F only

Semester 5	MC	Semester 6	MC
ESE3201 Air Quality Management	4	ESE3101 Solid and Hazardous Waste Mgmt	4
ESE3401 Sustainable Urban Water Technology	4	ESE3301 Environmental Microbiological Principles	4
CE2134 Hydraulics	4	EE2211 Introduction to Machine Learning	4
IE2141 System Thinking and Dynamics	4	Professional Development Module1	4
GE 3	4	GE 4	4
Sub-total	20	Sub-total	20

Note: If took GE4 in Semester 4, can remain with 16 MCs workload here

SPECIAL TERM (SUMMER HOLIDAYS)

Vacation Internship (VIP) {fulfill Free Elective ² }	6
-----------------------------------------------------------------	---

Note: instead of VIP, you can take modules of total to 6 MCs (eg. 4 MCs + 2 MCs) during Special Term/s or during the normal semester

Semester 7	MC	Semester 8	MC
ESE4502R B.Eng. Dissertation	4	ESE4502R B.Eng. Dissertation	4
ESE4501 Design Project	4	Professional Development Module2	4
GE5	4	UEM2	4
Technical Elective1	4	EG2401A Engineering Professionalism	2
Free Elective Module	4	Technical Elective2	4
Sub-total	20	Sub-total	18
TOTAL			124

Total 124 + 36 APCs = 160 MCs

¹MA1301 can be counted towards UEM. Students with the relevant Diploma Plus Certificate or Advanced Modules in Mathematics from Singapore Polytechnic or Ngee Ann Polytechnic could be waived from the requirement of taking MA1301.

²Direct poly entry students are not required to take EG3611A Industrial Attachment. In-lieu of the Industrial Attachment, students have 10MCs of Free Electives (same as UEM). The free electives can be read in any semester and can be any modules out of your major requirements.

³UEM and Free Electives can be read in any semester and can be any modules out of your major requirements. GE too can be read in any semester, except GEQ.

Updated 10 July 2020

Pre-allocate