B.Eng. (Environmental Engineering) Degree Requirement - matriculating August 2017

Information updated 1 July 2018

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.
- For programmes having 10 MCs of IA requirement (compulsory), if no module taken during the period, students may take up to 10 MCs of modules during the special terms, with waived tuition fees.
- Students should not read more than 60 MCs of Level-1000 modules towards their degree requirements.
- Satisfy all other requirements as prescribed by the Faculty or the University.

Students may opt for one of the following programs:

- **Minor in Civil Infrastructure Engineering [**details, please refer to http://cee.nus.edu.sg/programmes/BEng_Env.html#CivilInfrastructure **]**
- Double Degree in Bachelor of Engineering (Civil) and Bachelor of Arts (Economics)
- Double Degree in Bachelor of Engineering (Civil) and Bachelor of Arts (Accountancy)
- Double Degree in Bachelor of Engineering (Civil) and Bachelor of Business Administration
- Double Degree with either Ecole Polytechnique (X) or Ecole Central Paris (ECP) or Ecole Nationale Superieure des Minesde Paris (ENSMP) leading to Bachelor of Engineering (Civil), Diplome d'Ingenieur and Master of Engineering or Master of Science
- Dual Majors in Civil Engineering and various other disciplines. Please visit the following websites: https://www.eng.nus.edu.sg/undergraduatestudies/special-programmes/double-degrees/

Table A: B.Eng. (Environmental) Degree Requirements

AY2017/18 EVE Requirements	
General Education (GE) (5 Modules, each of 4MCs) • **H**uman and Cultures (GEH) • Quantitative **R**easoning (GER) • **T**hinking and Expression (GET) • **S**ingapore Studies (GES) • Asking **Q**uestions (GEQ)	**20**
Faculty Requirements	**6**
ES1531 Critical Thinking and Writing [1]	4
EG2401A ~~EG2401~~ Engineering Professionalism	2
(ES1xxx English [2])	
Foundational Requirements	**16**
PC1431 Physics IE	4
CE2409 Computer Applications in Civil Engineering	4
CM1502 General & Physical Chemistry for Engrs	4
MA1511 Engineering Calculus	2
MA1512 Differential Equations for Engineering	2
Basic Engineering Modules	**16**
CE2134 Hydraulics	4
CE1101 Civil Engineering Principles & Practice	6
ESE1102 Principles & Practice in Infrastructure and Environment	6
Engineering Process/ Infrastructure Engineering (2 of the following courses):	**8**
CE2112 Soil Mechanics	4
CE2155 Structural Mechanics and Materials	4
CE3132 Water Resources Engineering	4
CN2121 Chemical Engineering Thermodynamics (*CN1111 & CN1502 as pre-requisites*)	4
LSM1401 Fundamentals of Biochemistry	4
CE2183 Construction Project Management	4
AR2723 Strategies for Sustainable Architecture	4
Environmental Engineering Core Modules	**28**
ESE1001 Environmental Engineering Fundamentals	4
ESE2001 Environmental Processes	4
ESE2401 Water Science & Technology	4
ESE3101 Solid and Hazardous Waste Management	4
ESE3201 Air Quality Management	4
ESE3301 Environmental Microbiological Principles	4
ESE3401 Water & Wastewater Engineering 1	4
EVE Project & Internship Modules	**22**
ESE4501 Design Project	4
ESE4502R B.Eng. Dissertation	8
EG3611a Industrial Attachment [3]	10
EVE Technical Electives	**4**
Pathway Elective Modules	**8**
Unrestricted Elective Modules	**32**
Total MCs:	**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 ES1531.

[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.

Please refer to this link https://www.eng.nus.edu.sg/undergraduatestudies/academics/undergraduate-curriculum/faculty-requirements/ for details. (Faculty of Engineering's Undergraduate Studies website under Student Programmes → Academics → UG Curriculum → Faculty Requirement

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

Technical Elective Modules*

Department of Civil and Environmental Engineering

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
ESE5003 Environmental Chemical Principles
ESE5201 Combustion Pollution Control
ESE5202 Air Pollution Control Technology
ESE5203 Aerosol Science and Technology
ESE5204 Toxic & Hazardous Waste Management
ESE5205 Sludge and Solid Waste Management
ESE5301 Environmental Biological Principles
ESE5401 Water Quality Management
ESE5402 Industrial Wastewater Control
ESE5403 Water Reclamation & Reuse
ESE5404 Biological Treatment Processes
ESE5405 Water Treatment Processes
ESE5406 Membrane Treatment Process and Modelling
ESE5601 Environmental Risk Assessment
ESE5602 Environmental Management Systems
ESE5603 Pollution Minimisation and Prevention
CE3102 Engineering of Socio-Technical System
CE5307 Wave Hydrodynamics and Physical Oceanography
CE5310 Hydroinformatics
CE5312 River Mechanics
CE5603 Engineering Economics & Project Evaluation
CE5804 Global Infrastructure Project Management
CE5883A Topics in Hydraulic & Water 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

Practicing Professional Pathway (PPP)

Sample Semester Schedule for A-Level & Equivalent EVE students – Industrial Attachment in Sem 6

Semester 1	MCs	Semester 2	MCs
MA1511 Engineering Calculus	2	CM1502 General and Physical Chemistry for Engrs	4
MA1512 Differential Equations for Engineering	2	ESE1102 Principles & Practice in Infrastructure and Environment	6
PC1431 Physics IE	4	Engineering Process/Infrastructure Engineering Elective 1	4
CE1101 Civil Engineering Principles & Practice	6	~~GET1021~~[1] GET[1]	4
ESE1001 Environmental Engrg Fundamentals	4	GEH/GES[1]	4
GER1000[1]	4		
Sub-total	**22**	**Sub-total**	**22**
Semester 3		Semester 4	
Engineering Process/Infrastructure Engineering Elective 2	4	ESE2401 Water Science & Technology	4
CE2409 Computer Applications in Civil Engineering	4	**ESE3101 Solid and Hazardous Waste Mgmt** ~~UEM 2~~[2]	4
ESE2001 Environmental Processes	4	ES1531 Critical Thinking and Writing	4
CE2134 Hydraulics	4	~~UEM 1~~[2] **ESE3301 Environmental Microbiological Principles**	4
GES/GEH[1]	4	GEQ[1]	4
Sub-total	**20**	**Sub-total**	**20**
Semester 5		Semester 6	
ESE3201 Air Quality Management	4	EG3611a Industrial Attachment	10
~~ESE3301 Environmental Microbiological Principles~~ **UEM 1**[2]	4		
ESE3401 Water & Wastewater Engineering 1	4		
UEM 2[2] ~~ESE3101 Solid and Hazardous Waste Mgmt~~	4		
UEM 3[2]	4		
Sub-total	**20**	**Sub-total**	**10**
SPECIAL TERM (SUMMER HOLIDAYS)			
UEM 4[2]	4		
UEM 5[2]	4		
Sub-total	**8**		
Semester 7		Semester 8	
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[2]	4
UEM 6[2]	4	UEM 7[2]	4
Technical Elective	4	EG2401 Engineering Professionalism	2
Sub-total	**20**	**Sub-total**	**18**
TOTAL			**160**

[1]Students are strongly encouraged to complete all the five GE modules latest by the end of Year 2.
[2]UEM can be read in any semester and can be any module out of your major requirements.
[3]PPP students will have to take 8 MCs of professional development electives to satisfy pathway requirements.

Please note that this semester schedule is only a sample, you can customized your own schedule taking into considerations the semester the modules are offered and the pre- and co-requisites of a module.

Pre-allocated

Research-Focused Pathway (RfP)

Sample Semester Schedule for A-Level & Equivalent EVE students – Industrial Attachment in Sem 6

Semester 1	MCs	Semester 2	MCs
MA1511 Engineering Calculus	2	CM1502 General and Physical Chemistry for Engrs	4
MA1512 Differential Equations for Engineering	2	ESE1102 Principles & Practice in Infrastructure and Environment	6
PC1431 Physics IE	4	Engineering Process/Infrastructure Engineering Elective 1	4
CE1101 Civil Enggineering Principles & Practice	6	~~GET1021~~[1] GET [1]	
ESE1001 Environmental Engrg Fundamentals	4	GEH[1]	4
GER1000[1]	4		
Sub-total	**22**	**Sub-total**	**22**
Semester 3		Semester 4	
Engineering Process/Infrastructure Engineering Elective 2	4	ESE2401 Water Science & Technology	4
CE2409 Computer Applications in Civil Engineering	4	**ESE3101 Solid and Hazardous Waste Mgmt** ~~UEM 2~~[2]	4
ESE2001 Environmental Processes	4	ES1531 Critical Thinking and Writing	4
CE2134 Hydraulics	4	~~UEM 1~~[2] **ESE3101 Solid and Hazardous Waste Mgmt**	4
GE 4[1]	4	GEQ [1]	4
Sub-total	**20**	**Sub-total**	**20**
Semester 5		Semester 6	
ESE3201 Air Quality Management	4	EG3611a Industrial Attachment	10
~~ESE3301 Environmental Microbiological Principles~~ **UEM 1**[2]	4		
ESE3401 Water & Wastewater Engineering 1	4		
UEM 2[2] ~~ESE3101 Solid and Hazardous Waste Mgmt~~	4		
UEM 3[2]	4		
Sub-total	**20**	**Sub-total**	**10**
SPECIAL TERM (SUMMER HOLIDAYS)			
UEM 4[2]	4		
UEM 5[2]	4		
Sub-total	**8**		
Semester 7		Semester 8	
ESE4502R B.Eng. Dissertation	4	ESE4502R B.Eng. Dissertation	4
ESE4501 Design Project	4	Research Pathway Module[3]	4
Research Pathway Module[3]	4	UEM 8[2]	4
UEM 6[2]	4	UEM 7[2]	4
Technical Elective	4	EG2401 Engineering Professionalism	2
Sub-total	**20**	**Sub-total**	**18**
TOTAL			**160**

[1]*Students are strongly encouraged to complete all the five GE modules latest by the end of Year 2.*
[2]*UEM can be read in any semester and can be any module out of your major requirements.*
[3]*RfP students will have to take 8 MCs of research development electives to satisfy pathway requirements.*

Please note that this semester schedule is only a sample, you can customized your own schedule taking into considerations the semester the modules are offered and the pre- and co-requisites of a module.

Innovation & Design Centric Programme (iDCP)

Sample Semester Schedule for A-Level & Equivalent EVE students

Semester 1	MCs	Semester 2	MCs
MA1511 Engineering Calculus	2	CM1502 General and Physical Chemistry for Engrs	4
MA1512 Differential Equations for Engineering	2	ESE1102 Principles & Practice in Infrastructure and Environment	6
PC1431 Physics IE	4	Engineering Process/ Infrastructure Engineering Elective 1	4
CE1101 Civil Engineering Principles & Practice	6	**EG2201A Introduction to Design Thinking**	**4**
ESE1001 Environmental Engrg Fundamentals	4	GE 2[1]	4
GER1000[1]	4		
Sub-total	**22**	**Sub-total**	**22**
Semester 3		Semester 4	
~~Engineering Process/Infrastructure Engineering Elective 2~~ ES1531 Critical Thinking and Writing	4	ESE2401 Water Science & Technology	4
CE2409 Computer Applications in Civil Engineering	4	ESE3101 Solid and Hazardous Waste Mgmt	4
ESE2001 Environmental Processes	4	~~GE 3[1]~~ ESE3301 Environmental Microbiological Principles	4
CE2134 Hydraulics	4	**EG3301R DCP project**	**6**
EG2301 Case Studies in Engineering	**4**	~~UEM 1[2]~~ GE 4[1] [GEQ]	4
(CFG1010 Roots & Wings)	(2)		
Sub-total	**20** (22)	**Sub-total**	**22**
SPECIAL TERM (SUMMER HOLIDAYS)			
EG3612 Vacation Internship Programme	6		
Sub-total	**6**		
Semester 5		**Semester 6**	
ESE3201 Air Quality Management	4	**Innovation & Enterprise Elective 1**	**4**
ESE3401 Water & Wastewater Engineering 1	4	~~GE 4[1]~~ Technical Elective 1	4
EG3301R DCP Project	**6**	~~GE 5[1]~~ Technical Elective ~~1~~ 2	4
~~ESE3101 Solid and Hazardous Waste Mgmt~~ Engineering Process/Infrastructure Engineering Elective 2	4	~~ES1531 Critical Thinking and Writing~~ GE 5[1]	~~4~~
~~ESE3301 Environmental Microbiological Principles~~	~~4~~	Technical Elective ~~1~~ 3	4
Sub-total	**~~18~~ ~~22~~ 18**	**Sub-total**	**~~16~~ 20**
Semester 7		**Semester 8**	
EG4301 DCP B.Eng. Dissertation	**6**	**EG4301 DCP B.Eng. Dissertation**	**6**
~~UEM 2[2]~~ ~~ESE3401 Water & Wastewater Engineering 1~~ GE 5[1]	4	**Innovation & Enterprise Elective 2**	**4**
~~UEM 3[2]~~ **Innovation & Enterprise Elective 2 (UEM)**	**4**	**Innovation & Enterprise Elective 3**	**4**
~~UEM 4[2]~~	~~4~~	EG2401A Engineering Professionalism	2
Sub-total	**~~18~~ 14**	**Sub-total**	**16**
Total			**160 (162)**

[1]*Students are strongly encouraged to complete all the five GE modules latest by the end of Year 2.*
[2]*UEM can be read in any semester and can be any module out of your major requirements.*

Please note that this semester schedule is only a sample, you can customized your own schedule taking into considerations the semester the modules are offered and the pre- and co-requisites of a module.

Accredited Poly Direct Entry EVE Students as of AY2017/2018

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
ESE1001	Environmental Engineering Fundamentals *	4
ESE1102	Principles & Practice in Infrastructure and Environment *	6
CE2409	Computer Applications in Civil Engg. *	4
ES110_	English **	-
(PC1431)	Physics IE ***(if passed APC test)*** *	(4)
Total		**34 (38)**

▪ University Level Requirements
ˇ Faculty Requirements
* Programme Requirements

Note:

- 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 if they are exempted from MA1301, before registering for MA1301.

- Students should not read more than 60 MCs of Level-1000 modules towards their degree requirements (minimum of 160 MCs for graduation). 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	MCs	Semester 4	MCs
MA1301 Introductory Mathematics	4	MA1511 Engineering Calculus	2
ESE2001 Environmental Processes	4	MA1512 Differential Equations for Engineering	2
PC1431 Physics IE	4	ESE2401 Water Science & Technology	4
CE1101 Civil Engineering Principles & Practice	6	CM1502 General and Physical Chemistry for Engrs	4
GER1000	4	GE 2	4
		GE 3	4
Sub-total	**22**	**Sub-total**	**20**
Semester 5		Semester 6	
Engineering Process/Infrastructure Engineering Elective 1	4	ESE3101 Solid and Hazardous Waste Mgmt	4
Engineering Process/Infrastructure Engineering Elective 2	4	~~Free Elective Module[2]~~ ESE3301 Environmental Microbiological Principles	4
ESE3401 Water and Wastewater Engineering 1	4	UEM 1[3]	4
CE2134 Hydraulics	4	GE 5	4
GE 4	4	ES1531 Critical Thinking and Writing	4
Sub-total	**20**	**Sub-total**	**20**
SPECIAL TERM (SUMMER HOLIDAYS)			
Vacation Internship (VIP) {*fulfil Free Elective*}	6		
Sub-total	**6**		
Semester 7		Semester 8	
ESE4502R B.Eng. Dissertation	4	ESE4502R B. Eng. Dissertation	4
ESE4501 Design Project	4	Professional Development Module[3]	4
Technical Elective	4	Professional Development Module[3]	4
ESE3201 Air Quality Management	4	EG2401 Engineering Professionalism	2
~~ESE3301 Environmental Microbiological Principles~~ Free Elective Module[2]	~~4~~	UEM 2[3]	4
Sub-total	**20**	**Sub-total**	**18**
TOTAL			126

126 + 34 = 160

[1]MA1301 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.

[2]Free elective module can be read in any semester and can be any modules out of your major requirements.

[3]UEM can be read in any semester and can be any modules out of your major requirements.

These modules (GE, Free Electives) can be read in any semester

Pre-allocated