

B.Eng. (Civil Engineering) Degree Requirement - matriculating August 2018

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

- Complete a minimum of 160 MCs with a CAP \geq 2.0
- Pass the modules in accordance with **Table A**
- Pass Pathway technical elective modules.
- Students should 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), CFG1002 Career Catalyst (2 MCs), and ES1103 English for Academic Purposes (4 MCs))
- Satisfy all other requirements as prescribed by the Faculty or the University

AY2018/2019 CE Requirements	
General Education (GE) (5 Modules, each of 4MCs)	20
<ul style="list-style-type: none"> • <u>H</u>uman and Cultures (GEH) • <u>Q</u>uantitative Reasoning (GER) • <u>T</u>hinking and Expression (GET) • <u>S</u>ingapore Studies (GES) • <u>A</u>sking <u>Q</u>uestions (GEQ) 	
Faculty Requirements	6
ES1531 Critical Thinking and Writing *	4
EG2401A Engineering Professionalism (ES1xxx English)	2
Foundational Requirements	24
MA1505 Mathematics I	4
PC1431 Physics IE	4
CE2409 Computer Applications in Civil Engineering	4
CE1101 Civil Engineering Principles & Practice	6
CE1102 Principles & Practice in Infrastructure and Environment	6
CE Core Modules	52
CE2112 Soil Mechanics (G)	4
CE2134 Hydraulics (H)	4
CE2155 Structural Mechanics and Materials (S)	4
CE2183 Construction Project Management (C)	4
CE2407 Engineering and Uncertainty Analyses	4
ESE3001 Water Quality Engineering (E)	4
CE3115 Geotechnical Engineering (G)	4
CE3116 Foundation Engineering (G)	4
CE3121 Transportation Engineering (T)	4
CE3132 Water Resources Engineering (H)	4
CE3155 Structural Analysis (S)	4
CE3165 Structural Concrete Design (S)	4
CE3166 Structural Steel Design and System (S)	4
CE Project & Internship Modules	22
CE4103 Design Project	4
CE4104 B.Eng. Dissertation	8
EG3611A Industrial Attachment	10
Pathway Requirement Modules	8
Unrestricted Elective Modules	28
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 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.

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).

Please visit CEE website for more details <http://www.eng.nus.edu.sg/cee/> for details.

Information correct as 30 October 2018

Technical Elective Modules

Geotechnical Engineering Modules (G)

- CE5101 Seepage and Consolidation of Soils
- CE5104 Underground Space
- CE5105 Anal. & Num. Meth. in Foundation Eng. rg
- CE5106 Ground Improvement
- CE5107 Pile Foundations
- CE5108 Earth Retaining Structures
- CE5881 Topics in Geotechnical Engineering †

Environmental Engineering Modules (E)

- ESE3101 Solid and Hazardous Waste Management
- ESE4401 Water & Wastewater Engineering 2
- ESE4405 Urban Water Engineering & Management
- ESE5205 Sludge & Solid Waste Management
- ESE5402 Industrial Water Control

Structural Engineering Modules (S)

- CE4257 Linear Finite Element Analysis
- CE4258 Structural Stability and Dynamics
- CE5509 Advanced Structural Steel Design
- CE5510 Advanced Structural Concrete Design
- CE5513 Plastic Analysis of Structures
- CE5604 Advanced Concrete Technology
- CE5610 Assessment and Retrofit of Concrete Structures
- CE5611 Precast Concrete Technology
- ME5103 Plates and Shells
- CE5885 Topics in Structural Engineering †
- CE5886 Topics in Concrete Engineering †

Infrastructure Systems Modules (C and T)

CE4221	Design of Land Transport Infrastructure
CE4282	Building Information Modelling for Project Management
CE5204	Pavement Design and Rehabilitation
CE5205	Transportation Planning
CE5207	Pavement Network Management Systems
CE5603	Engineering Economics and Project Evaluation
CE5804	Global Infrastructure Project Management
CE5805	Construction Equipment and Methods
CE5806	Construction Project and Site Control
CE5880	Topics in Project Management Engineering [†]
CE5882	Topics in Transportation Engineering [†]
TP5025	Intelligent Transportation Systems
TP5026	Transport Management & Policy
TP5027	Transport & Freight Terminal Management
TP5028	Intermodal Transportation Operations

Hydraulic Modules (H)

CE4247	Treatment Plant Hydraulic
CE5307	Wave Hydrodynamics
CE5308	Coastal Processes & Sediment Transport
CE5312	River Mechanics
CE5313	Groundwater Hydrology
CE5883	Topics in Hydraulic & Water Resources [†]

Offshore Modules (O)

OT5101	Exploration and Production of Petroleum
OT5202	Analysis & Design of Offshore Structures
OT5203	Design of Floating Structures
OT5204	Moorings & Risers
OT5205	Offshore Pipelines
OT5206	Offshore Foundations
OT5207	Arctic Engineering
OT5401	Geoscience for Petroleum Exploration
OT5402	Seismic Acquisition and Processing
OT5403	Petrophysics and Downhole Measurements
OT5404	Reservoir Characterization and Rock Physics
OT5405	Enhanced Oil Recovery
OT5406	Petroleum Production Engineering
OT5407	Petroleum Geomechanics
OT5881	Topics in Offshore Engineering [†]
OT5882	Topics in Subsea Engineering [†]

CE Technical Modules

CE3101	Integrated Infrastructure Project
CE3102	Socio-economic sustainable developments
GE2215	Introduction to GIS
GE3238	GIS Design and Practice
CE5701	Special Topics in Civil Engineering
CE5702	CE Reliability Analysis and Design

[†] depending on the topics covered

Practicing Professional Pathway (PPP)

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

Semester 1	MCs	Semester 2	MCs
MA1505 Mathematics I	4	CE2155 Structural Mechanics and Materials	4
PC1431 Physics IE	4	CE1102 Principles & Practice in Infrastructure and Environment	6
CE1101 Civil Engineering Principles & Practice	6	ES1531 Critical Thinking and Writing	4
CE2409 Computer Applications in Civil Engineering	4	GE 2 ¹	4
GER1000	4	GE 3 ¹	4
Sub-total	22	Sub-total	22
Semester 3		Semester 4	
CE2112 Soil Mechanics	4	CE3115 Geotechnical Engineering	4
CE2134 Hydraulics	4	CE3155 Structural Analysis CE3166 Structural Steel Design and System	4
CE2183 Construction Project Management-	4	CE3132 Water Resources Engineering	4
CE2407 Engineering and Uncertainty Analyses	4	ESE3001 Water Quality Engineering	4
GE 4 ¹	4	GE 5 ¹ (GEQ1000)	4
UEM 1 ² CE3155 Structural Analysis	4		
Sub-total	24	Sub-total	20
Semester 5		Semester 6	
CE3116 Foundation Engineering	4	EG3611a Industrial Attachment	10
CE3121 Transportation Engineering	4	EG2401 Engineering Professionalism	2
CE3165 Structural Concrete Design	4		
CE3166 Structural Steel Design and System UEM 1 ²	4		
UEM 2 ²	4		
Sub-total	20	Sub-total	12
Semester 7		Semester 8	
CE4104 B.Eng.Dissertation	4	CE4104 B.Eng.Dissertation	4
CE4103 Design Project	4	Professional Development Module ³	4
UEM 3 ²	4	Professional Development Module ³	4
UEM 4 ²	4	UEM 6 ²	4
UEM 5 ²	4	UEM 7 ²	4
Sub-total	20	Sub-total	20
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 MC 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 CE students – Industrial Attachment in Sem 6

Semester 1	MCs	Semester 2	
MA1505 Mathematics I	4	CE2155 Structural Mechanics and Materials	4
PC1431 Physics IE	4	CE1102 Principles & Practice in Infrastructure and Environment	6
CE1101 Civil Engineering Principles & Practice	6	ES1531 Critical Thinking and Writing	4
CE2409 Computer Applications in Civil Engineering	4	GE 2 ¹	4
GE 1 ¹	4	GE 3 ¹	4
Sub-total	22	Sub-total	22
Semester 3		Semester 4	
CE2112 Soil Mechanics	4	CE3115 Geotechnical Engineering	4
CE2134 Hydraulics	4	CE3132 Water Resources Engineering	4
CE2407 Engineering and Uncertainty Analyses	4	CE3166 Structural Steel Design and System	4
CE3155 Structural Analysis	4	ESE3001 Water Quality Engineering	4
GE 4 ¹	4	GE 5 ¹ (GEQ1000)	4
UEM 1 ²	4		
Sub-total	24	Sub-total	20
Semester 5		Semester 6	
CE2183 Construction Project Management	4	EG3611a Industrial Attachment	10
CE3116 Foundation Engineering	4	EG2401 Engineering Professionalism	2
CE3121 Transportation Engineering	4		
CE3165 Structural Concrete Design	4		
UEM 2 ²	4		
Sub-total	20	Sub-total	12
Semester 7		Semester 8	
CE4104 B.Eng.Dissertation (Research-based)	4	CE4104 B.Eng.Dissertation (Research-based)	4
CE4103 Design Project	4	Research Development Elective ³	4
UEM 3 ²	4	Research Development Elective ³	4
UEM 4 ²	4	UEM 6 ²	4
UEM 5 ²	4	UEM 7 ²	4
Sub-total	20	Sub-total	20
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.

³RfP students will have to take 8 MC 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 CE students

Semester 1		MCS	Semester 2	
MA1505 Mathematics I	4		CE2155 Structural Mechanics and Materials	4
PC1431 Physics IE	4		ES1531 Critical Thinking and Writing	4
CE1101 Civil Engineering Principles & Practice	6		CE1102 Principles & Practice in Infrastructure and Environment	6
CE2409 Computer Applications in Civil Engineering	4		EG2201A Introduction to Design Thinking	4
GE 1 ¹	4			
Sub-total	22		Sub-total	18
Semester 3			Semester 4	
CE2112 Soil Mechanics	4		CE3115 Geotechnical Engineering	4
CE2134 Hydraulics	4		CE3155 Structural Analysis CE3166 Structural Steel Design and System	4
CE2183 Construction Project Management CE3155 Structural Analysis	4		GE 2 ¹	4
CE2407 Engineering and Uncertainty Analyses	4		GE 3 ¹	4
EG2301 Case Studies in Engineering	4		EG3301R DCP Project	6
Sub-total	20		Sub-total	22
SPECIAL TERM (SUMMER HOLIDAYS)				
Vacation Internship (VIP)	6			
Sub-total	6			
Semester 5			Semester 6	
CE3116 Foundation Engineering	4		CE3132 Water Resources Engineering	4
CE3121 Transportation Engineering	4		ESE3001 Water Quality Engineering	4
CE3165 Structural Concrete Design	4		GE 4 ¹	4
CE3166 Structural Steel Design and System CE2183 Construction Project Management	4		GE 5 ¹	4
EG3301R DCP Project	6			
Sub-total	22		Sub-total	16
Semester 7			Semester 8	
EG4301 DCP B.Eng. Dissertation	6		EG4301 DCP B.Eng. Dissertation	6
CE4103 Design Project	4		Innovation & Enterprise Elective 2	4
Innovation & Enterprise Elective 1	4		Innovation & Enterprise Elective 3	4
EG2401 Engineering Professionalism	2		UEM 1 ²	4
Sub-total	16		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.

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 CE Students as of AY2018/2019

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
CE1101	Civil Engineering Principles & Practice *	6
CE1102	Principles & Practice in Infrastructure and Environment *	6
CE2409	Computer Applications in Civil Engg. *	4
(PC1431 or MA1505)	Physics IE or MA1505 Mathematics I (<i>if passed APC test</i>) *	(4)
Total		36 (40)

- University Level Requirements
- ∨ Faculty Requirements
- * Programme Requirements

Note:

- For students with Diploma related to Environmental and Water Technology from Singapore Polytechnic or Ngee Ann Polytechnic will be exempted from ESE3001 Water Quality Engineering (4 MCs) but will be required to take CE1101 Civil Engineering Principles & Practice (6 MCs). They will have a total APCs of 34 MCs.
- 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 CE students

Semester 3	MCS	Semester 4	MCS
MA1301 Introductory Mathematics ¹	4	CE2155 Structural Mechanics and Materials	4
PC1431 Physics IE	4	CE3155 Structural Analysis GE 1 (GER1000)	4
CE2112 Soil Mechanics	4	CE3115 Geotechnical Engineering GE 4	4
CE2134 Hydraulics	4	MA1505 Mathematics 1	4
CE2183 Construction Project Management (CE1101)	4 (6)	ES1531 Critical Thinking and Writing	4
Sub-total	20 (22)	Sub-total	20
Semester 5		Semester 6	
CE3121 Transportation Engineering	4	CE3132 Water Resources Engineering	4
CE3116 Foundation Engineering	4	ESE3001 Water Quality Engineering (GE 2)	4
CE3165 Structural Concrete Design	4	GE 2 CE3166 Structural Steel Design and System	4
CE3166 Structural Steel Design and System GE 2 (CE2183)	4	GE 3 (GEQ1000)	4
GE 1 CE3155 Structural Analysis	4	GE 4 CE3115 Geotechnical Engineering	4
Sub-total	20	Sub-total	20
SPECIAL TERM (SUMMER HOLIDAYS)			
Vacation Internship (VIP) {fulfill Free Elective ² }	6		
Sub-total	6		
Semester 7		Semester 8	
CE4104 B.Eng.Dissertation	4	CE4104 B.Eng.Dissertation	4
CE4103 Design Project	4	Professional Development Module	4
CE2407 Engineering and Uncertainty Analyses	4	Professional Development Module	4
GE 5	4	Free Elective Module ²	4
EG2401 Engineering Professionalism	2	UEM ³	4
Sub-total	18	Sub-total	20
TOTAL			124

(students not from CE-related diploma (126+34=160))

124 + 36 = 160

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.

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

³UEM 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-allocate