

**Bachelor of Engineering (Chemical Engineering)
with Second Major in Innovation & Design**

Cohorts 2017/2018 and 2018/2019

Modular Requirements	Modular Credits (MCs)
University Level Requirements	
General education modules:	
• Quantitative Reasoning (GER1000)	4
• Thinking & Expression (GET)	4
• Human Cultures (GEH)	4
• Singapore Studies (GES)	4
• Asking Questions (GEQ1000)	4
Sub-total for University Level Requirements	20
Programme Requirements	
Faculty requirements:	
• ES1531 Critical Thinking & Writing ¹ <i>(Double-counted for Second Major in Innovation & Design)</i>	4
• EG2401A Engineering Professionalism	2
• ES1xxxx English ²	-
Year 1 and core modules:	
• CN1101 Chemical Engineering Principles & Practice I	6
• CN1102 Chemical Engineering Principles & Practice II	6
• MA1511 Engineering Calculus	2
• MA1512 Differential Equations for Engineering	2
• MA1513 Linear Algebra & Differential Equations	2
• CM1502 General & Physical Chemistry for Engineers	4
• CN2101 Material & Energy Balances	3
• CN2116 Chemical Kinetics & Reactor Design	4
• CN2121 Chemical Engineering Thermodynamics	4
• CN2122 Fluid Mechanics	5
• CN2125 Heat & Mass Transfer	4
• CN3101 Chemical Engineering Lab 1	4
• CN3102 Chemical Engineering Lab 2	4
• CN3121 Process Dynamics & Control	4
• CN3132 Separation Processes	4
• CN3135 Process Safety, Health & Environment	3
• CN3421 Process Modelling & Numerical Simulation	4
• CN4122 Process Synthesis & Simulation	3
CHE technical electives ³	10
CHE design and project modules:	
• CN4123R Final Year Design Project	6
• EG4301 DCP Dissertation <u>or</u> EG4301A Ideas to Start-up (over 2 consecutive semesters) <i>(Double-counted for Second Major in Innovation & Design and replaces CN4118 B.Eng. Dissertation)</i>	12
EG3612 Vacation Internship Programme (VIP) ³	6
Sub-total for Programme Requirements	108
Unrestricted Elective Modules (UEM)	
• Group A module for Second Major	4
• Group B module for Second Major	4
• Group C modules for Second Major – Innovation & Enterprise electives	12
• EG3301R DCP Project (over 2 consecutive semesters)	12
Sub-total for Unrestricted Elective Modules	32
Total	160

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Notes:

- ¹ Students in USP, UTRP, and RVRC may read an equivalent module (e.g. ES1501X Academic Expository Writing) in lieu of EG1531.
- ² Students who have not passed or been exempted from the Qualifying English Test at the point of admission will have to read ES1000 and/or ES1103. ES1103 carries 4 MCs which may be counted as UEM.
- ³ Students in this Second Major are allowed to complete EG3612 (6 MCs) in lieu of EG3611A (10 MCs) or EG3611B (12 MCs).

EG3612 (VIP) is optional for poly-intake students and those in the following special programmes: double degree programmes (DDP), concurrent degree programmes (CDP), Chemical Sciences Programme (CSP), and Global Engineering Programme (GEP).

Students may also opt to do EG3611A (10 MCs) in lieu of EG3612 (6 MCs) and 4 MCs of technical electives.

Recommended semester schedule for Cohorts 2017/2018 and 2018/2019
– JC-intake students or equivalent

Semester 1	MCs	Semester 2	MCs
CN1101 Chemical Engineering Principles & Practice I	6	CN1102 Chemical Engineering Principles & Practice II	6
MA1511 Engineering Calculus	2	MA1512 Differential Equations for Engineering	2
GET	4	MA1513 Linear Algebra & Differential Equations	2
GES	4	CM1502 General & Physical Chemistry for Engineers	4
GEH	4	GER1000 Quantitative Reasoning	4
		Group A module for Second Major (UEM)	4
Sub-total	20	Sub-total	22

Semester 3	MCs	Semester 4	MCs
CN2101 Material & Energy Balances	3	EG3301R DCP Project (UEM)	6
CN2121 Chemical Engineering Thermodynamics	4	Innovation & Enterprise Elective 1 (UEM)	4
CN2122 Fluid Mechanics	5	CN2125 Heat & Mass Transfer	4
GEQ1000 Asking Questions	4	CN2116 Chemical Kinetics & Reactor Design	4
ES1531 Critical Thinking & Writing (double-counted)	4	EG2401A Engineering Professionalism	2
Group B module for Second Major (UEM)	4		
Sub-total	24	Sub-total	20

Summer vacation between Semesters 4 and 5	MCs
EG3612 Vacation Internship Programme	6
Sub-total	6

Semester 5	MCs	Semester 6	MCs
EG3301R DCP Project (UEM)	6	Innovation & Enterprise Elective 2 (UEM)	4
CN3101 Chemical Engineering Lab 1	4	Innovation & Enterprise Elective 3 (UEM)	4
CN3121 Process Dynamics & Control	4	CN3102 Chemical Engineering Lab 2	4
CN3132 Separation Processes	4	CN4122 Process Synthesis & Simulation	3
		Technical Elective 1	4
Sub-total	18	Sub-total	19

Semester 7	MCs	Semester 8	MCs
EG4301 DCP Dissertation (double-counted)	6	EG4301 DCP Dissertation (double-counted)	6
CN3135 Process Safety, Health & Environment	3	CN4123R Final Year Design Project	6
CN3421 Process Modelling & Numerical Simulation	4	Technical Elective 3	2
Technical Elective 2	4		
Sub-total	17	Sub-total	14

Recommended semester schedule for Cohorts 2017/2018 and 2018/2019

– poly-intake students

(for students who intend to complete in 6 semesters and are exempted from Group A module for Second Major)

Semester 3	MCs	Semester 4	MCs
MA1301 Introductory Mathematics (in lieu of EG3612)	4	EG3301R DCP Project (UEM)	6
GET	4	Innovation & Enterprise Elective 1 (UEM)	4
GES	4	MA1511 Engineering Calculus	2
GEH	4	MA1512 Differential Equations for Engineering	2
Group B module for Second Major (UEM)	4	CM1502 General & Physical Chemistry for Engineers	4
		GEQ1000 Asking Questions	4
Sub-total	20	Sub-total	22

Semester 5	MCs	Semester 6	MCs
EG3301R DCP Project (UEM)	6	Innovation & Enterprise Elective 2 (UEM)	4
MA1513 Linear Algebra & Differential Equations	2	CN2116 Chemical Kinetics & Reactor Design	4
CN2121 Chemical Engineering Thermodynamics	4	CN2125 Heat & Mass Transfer	4
CN2122 Fluid Mechanics	5	CN3135 Process Safety, Health & Environment	3
GER1000 Quantitative Reasoning	4	CN3421 Process Modelling & Numerical Simulation	4
ES1531 Critical Thinking & Writing (double-counted)	4	Technical Elective 1	4
		EG2401A Engineering Professionalism	2
Sub-total	25	Sub-total	25

Semester 7	MCs	Semester 8	MCs
EG4301 DCP Dissertation (double-counted)	6	EG4301 DCP Dissertation (double-counted)	6
CN3101 Chemical Engineering Lab 1	4	Innovation & Enterprise Elective 3 (UEM)	4
CN3121 Process Dynamics & Control	4	CN4123R Final Year Design Project	6
CN3132 Separation Processes	4	CN3102 Chemical Engineering Lab 2	4
CN4122 Process Synthesis & Simulation	3	Technical Elective 3 (2 MCs are in lieu of EG3612)	4
Technical Elective 2	4		
Sub-total	25	Sub-total	24

Notes:

1. Poly-intake students may receive the following exemptions depending on their Diploma qualification:
 - CN1101 Chemical Engineering Principles & Practice I (6 MCs)
 - CN1102 Chemical Engineering Principles & Practice II (6 MCs)
 - CN2101 Material & Energy Balances (3 MCs)
 - Unrestricted elective modules (20 MCs)

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2. Poly-intake students may be exempted from Group A module for Second Major (4 MCs) and one Innovation & Enterprise elective (4 MCs) depending on their Diploma qualification. These would be included as part of the 20 MCs of exemptions for unrestricted elective modules.
3. EG3612 (VIP) is not compulsory for poly-intake students. The 6 MCs for VIP may be fulfilled by MA1301 (4 MCs) and/or other modules.

Recommended semester schedule for Cohorts 2017/2018 and 2018/2019

– poly-intake students

(for students who intend to complete in 7 semesters and are NOT exempted from Group A module for Second Major)

Semester 3	MCs	Semester 4	MCs
MA1301 Introductory Mathematics (in lieu of EG3612)	4	EG3301R DCP Project (UEM)	6
GET	4	MA1511 Engineering Calculus	2
GES	4	MA1512 Differential Equations for Engineering	2
GEH	4	CM1502 General & Physical Chemistry for Engineers	4
Group B module for Second Major (UEM)	4	GEQ1000 Asking Questions	4
		Group A module for Second Major (UEM)	4
Sub-total	20	Sub-total	22

Semester 5	MCs	Semester 6	MCs
EG3301R DCP Project (UEM)	6	Innovation & Enterprise Elective 1 (UEM)	4
MA1513 Linear Algebra & Differential Equations	2	CN2116 Chemical Kinetics & Reactor Design	4
CN2121 Chemical Engineering Thermodynamics	4	CN2125 Heat & Mass Transfer	4
CN2122 Fluid Mechanics	5	CN3135 Process Safety, Health & Environment	3
GER1000 Quantitative Reasoning	4	CN3421 Process Modelling & Numerical Simulation	4
ES1531 Critical Thinking & Writing (double-counted)	4	EG2401A Engineering Professionalism	2
Sub-total	25	Sub-total	21

Semester 7	MCs	Semester 8	MCs
EG4301 DCP Dissertation (double-counted)	6	EG4301 DCP Dissertation (double-counted)	6
CN3101 Chemical Engineering Lab 1	4	CN4123R Final Year Design Project	6
CN3121 Process Dynamics & Control	4	CN3102 Chemical Engineering Lab 2	4
CN3132 Separation Processes	4	Technical Elective 1	4
CN4122 Process Synthesis & Simulation	3		
Sub-total	21	Sub-total	20

Semester 9	MCs
Innovation & Enterprise Elective 2 (UEM)	4
Innovation & Enterprise Elective 3 (UEM)	4
Technical Elective 2	4
Technical Elective 3 (2 MCs are in lieu of EG3612)	4
Sub-total	16

Notes:

1. Poly-intake students may receive the following exemptions depending on their Diploma qualification:
 - CN1101 Chemical Engineering Principles & Practice I (6 MCs)
 - CN1102 Chemical Engineering Principles & Practice II (6 MCs)

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- CN2101 Material & Energy Balances (3 MCs)
 - Unrestricted elective modules (20 MCs)
2. Poly-intake students may be exempted from Group A module for Second Major (4 MCs) and one Innovation & Enterprise elective (4 MCs) depending on their Diploma qualification. These would be included as part of the 20 MCs of exemptions for unrestricted elective modules.
 3. EG3612 (VIP) is not compulsory for poly-intake students. The 6 MCs for VIP may be fulfilled by MA1301 (4 MCs) and/or other modules.