

**Bachelor of Engineering (Materials Science & 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:	
• MLE1001 Materials Science & Engineering Principles & Practice I	6
• MLE1002 Materials Science & Engineering Principles & Practice II	6
• MA1512 Differential Equations for Engineering	2
• MA1513 Linear Algebra & Differential Equations	2
• PC1432 Physics IIE	4
• CM1121 Basic Organic Chemistry <i>or</i> CM1501 Organic Chemistry for Engineers	4
• MLE2101 Introduction to Structure of Materials	4
• MLE2102 Thermodynamics & Phase Diagrams	4
• MLE2103 Phase Transformation & Kinetics	3
• MLE2104 Mechanical Properties of Materials	4
• MLE2105 Electronic Properties of Materials	4
• MLE3101 Materials Characterization Laboratory	3
• MLE3111 Materials Properties & Processing Laboratory	4
MLE technical electives (at least 16 MCs of Level 4000/5000 modules) ^{3,5}	34
MLE design and project modules:	
• EG3301R DCP Project ³ (over 2 consecutive semesters) <i>(Double-counted for Second Major in Innovation & Design and replaces MLE4102A Design Project)</i>	12
EG3612 Vacation Internship Programme (VIP) ^{3,4}	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
• EG4301R DCP Dissertation <i>or</i> EG4301A Ideas to Start-up ⁵ (over 2 consecutive semesters) <i>(replaces MLE4101A B.Eng. Dissertation)</i>	12
Sub-total for Unrestricted Elective Modules	32
Total	160

Innovation & Design Programme
Faculty of Engineering

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).

The 12 MCs for EG3301R are mapped by 8 MCs from MLE4102A and 4 MCs from the replacement of EG3611A (10 MCs) with EG3612 (6 MCs).

Students may also opt to do EG3611A (10 MCs) in lieu of EG3612 (6 MCs) and 4 MCs of technical electives.
- ⁴ 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).
- ⁵ Students in this Second Major are allowed to complete additional technical electives (6 MCs) in lieu of MLE4101A (6 MCs).

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

Semester 1	MCs	Semester 2	MCs
MLE1001 Materials Science & Engineering Principles & Practice I	6	MLE1002 Materials Science & Engineering Principles & Practice II	6
CM1501 Organic Chemistry for Engineers	4	MA1512 Differential Equations for Engineering	2
GER1000 Quantitative Reasoning	4	MA1513 Linear Algebra & Differential Equations	2
GET	4	PC1432 Physics IIE	4
ES1531 Critical Thinking & Writing (double-counted)	4	GES	4
		Group A module for Second Major (UEM)	4
Sub-total	22	Sub-total	22

Semester 3	MCs	Semester 4	MCs
MLE2101 Introduction to Structure of Materials	4	EG3301R DCP Project (double-counted)	6
MLE2102 Thermodynamics & Phase Diagrams	4	MLE2104 Mechanical Properties of Materials	4
MLE2103 Phase Transformation & Kinetics	3	MLE2105 Electronic Properties of Materials	4
GEQ1000 Asking Questions	4	MLE3101 Materials Characterization Laboratory	3
Group B module for Second Major (UEM)	4	GEH	4
Sub-total	19	Sub-total	21

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 (double-counted)	6	Innovation & Enterprise Elective 1 (UEM)	4
MLE3111 Materials Properties & Processing Laboratory	4	MLE Level 2000/3000 Elective 3	4
MLE Level 2000/3000 Elective 1	4	MLE Level 2000/3000 Elective 4	4
MLE Level 2000/3000 Elective 2	4	MLE Level 4000 Elective 1	4
		MLE Level 4000 Elective 2	4
Sub-total	18	Sub-total	20

Semester 7	MCs	Semester 8	MCs
EG4301 DCP Dissertation (UEM)	6	EG4301 DCP Dissertation (UEM)	6
Innovation & Enterprise Elective 2 (UEM)	4	Innovation & Enterprise Elective 3 (UEM)	4
MLE Level 4000 Elective 3	4	MLE Level 4000 Elective 4	4
EG2401A Engineering Professionalism	2	MLE Level 4000 Elective 5	2
Sub-total	16	Sub-total	16

Recommended semester schedule for Cohorts 2017/2018 and 2018/2019
– poly-intake students

Semester 3	MCs	Semester 4	MCs
MA1301 Introductory Mathematics (in lieu of EG3612)	4	EG3301R DCP Project (double-counted)	6
MLE2101 Introduction to Structure of Materials	4	MA1512 Differential Equations for Engineering	2
MLE2102 Thermodynamics & Phase Diagrams	4	MA1513 Linear Algebra & Differential Equations	2
MLE2103 Phase Transformation & Kinetics	3	PC1432 Physics IIE	4
GER1000 Quantitative Reasoning	4	MLE2104 Mechanical Properties of Materials	4
Group B module for Second Major (UEM)	4	MLE2105 Electronic Properties of Materials	4
		Group A module for Second Major (UEM)	4
Sub-total	23	Sub-total	26

Semester 5	MCs	Semester 6	MCs
EG3301R DCP Project (double-counted)	6	Innovation & Enterprise Elective 1 (UEM)	4
MLE3111 Materials Properties & Processing Laboratory	4	MLE3101 Materials Characterization Laboratory	3
MLE Level 2000/3000 Elective 1	4	MLE Level 2000/3000 Elective 2	4
GEQ1000 Asking Questions	4	MLE Level 2000/3000 Elective 3	4
GET	4	GEH	4
UEM (in lieu of EG3612)	2	GES	4
Sub-total	24	Sub-total	23

Semester 7	MCs	Semester 8	MCs
EG4301 DCP Dissertation (UEM)	6	EG4301 DCP Dissertation (UEM)	6
Innovation & Enterprise Elective 2 (UEM)	4	Innovation & Enterprise Elective 3 (UEM)	4
MLE Level 2000/3000 Elective 4	4	MLE Level 4000 Elective 3	4
MLE Level 4000 Elective 1	4	MLE Level 4000 Elective 4	4
MLE Level 4000 Elective 2	4	MLE Level 4000 Elective 5	2
EG2401A Engineering Professionalism	2		
Sub-total	24	Sub-total	20

Notes:

- Poly-intake students may receive the following exemptions depending on their Diploma qualification:
 - MLE1001 Materials Science & Engineering Principles & Practice I (6 MCs)
 - MLE1002 Materials Science & Engineering Principles & Practice II (6 MCs)
 - CM1501 Organic Chemistry for Engineers (4 MCs)
 - ES1531 Critical Thinking & Writing (4 MCs)
 - Unrestricted elective modules (20 MCs)
- Poly-intake students may be exempted from Group A module for Second Major (4 MCs) and/or 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.
- 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.