Innovation & Design Programme
Faculty of Engineering

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

Cohort 2019/2020

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:	
• ES2531 Critical Thinking & Writing [1]	4
• EG2401A Engineering Professionalism	2
• ES1xxxx English [2]	-
Year 1 and core modules:	
• ESP1111 Engineering Principles in Action	4
• ESP1104B Sensor System Electronics	4
• MA1507 Advanced Calculus	4
• MA1508E Linear Algebra for Engineering	4
• CS1010E Programming Methodology	4
• MLE1010 Materials Engineering Principles & Practice	4
• PC1433 Mechanics & Waves	4
• PC2130B Applied Quantum Physics	4
• PC2133 Applied Solid State Physics	4
• PC2134 Mathematical Methods in Physics	4
• PC2020 Electromagnetics for Electrical Engineers	4
• ESP2106 Principles of Continua	4
• ESP2107 Numerical Methods & Statistics	4
• ME2121 Engineering Thermodynamics & Heat Transfer	4
ESP electives (specialisation modules) [3]	24
ESP design and project modules:	
• ESP2110 Design Project	4
• EG4301 DCP Dissertation or EG4301A Ideas to Start-up (over 2 consecutive semesters) *(Double-counted for Second Major in Innovation & Design and replaces ESP4901 Research Project)*	12
EG3612 Vacation Internship Programme (VIP)	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	8
• EG3301R DCP Project [3] (over 2 consecutive semesters) *(replaces ESP3902 Major Design Project I and ESP3903 Major Design Project II)*	12
Other unrestricted electives	4
Sub-total for Unrestricted Elective Modules	**32**
Total	**160**

(updated 7 June 2021)

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Notes:

1   Students in USP, UTCP, and RVRC may read an equivalent module (e.g. UWC2101%, UTW1001%, ES1601, ES1501%) in lieu of ES2531.

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 additional technical electives (8 MCs) in lieu of ESP3902 (4 MCs) and ESP3903 (4 MCs).

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Recommended semester schedule for Cohort 2019/2020 – JC-intake students or equivalent

Semester 1	MCs	Semester 2	MCs
ESP1111 Engineering Principles in Action	4	ESP1104B Sensor System Electronics	4
MA1507 Advanced Calculus	4	MA1508E Linear Algebra for Engineering	4
PC1433 Mechanics & Waves	4	MLE1010 Materials Engineering Principles & Practice	4
CS1010E Programming Methodology	4	GER1000 Quantitative Reasoning	4
GET	4	GEQ1000 Asking Questions	4
		Group A module for Second Major (UEM)	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	MCs	Semester 4	MCs
ESP2106 Principles of Continua	4	EG3301R DCP Project (UEM)	6
ESP2107 Numerical Methods & Statistics	4	PC2130B Applied Quantum Physics	4
PC2020 Electromagnetics for Electrical Engineers	4	PC2133 Applied Solid State Physics	4
PC2134 Mathematical Methods in Physics I	4	ESP2110 Design Project	4
Group B module for Second Major (UEM)	4	ES2531 Critical Thinking & Writing	4
Sub-total	**20**	**Sub-total**	**22**

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 1 (UEM)	4
ESP Elective 1	4	ME2121 Engineering Thermodynamics & Heat Transfer	4
ESP Elective 2	4	ESP Elective 3	4
GES	4	ESP Elective 4	4
		GEH	4
Sub-total	**18**	**Sub-total**	**20**

Semester 7	MCs	Semester 8	MCs
EG4301 DCP Dissertation (replaces ESP4901)	6	EG4301 DCP Dissertation (replaces ESP4901)	6
Innovation & Enterprise Elective 2 (UEM)	4	ESP Elective 6	4
ESP Elective 5	4	UEM	4
EG2401A Engineering Professionalism	2		
Sub-total	**16**	**Sub-total**	**14**

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Recommended semester schedule for Cohort 2019/2020 – JC-intake students or equivalent
(for students in year-long NOC programmes)

Semester 1	MCs	Semester 2	MCs
ESP1111 Engineering Principles in Action	4	ESP1104B Sensor System Electronics	4
MA1507 Advanced Calculus	4	MA1508E Linear Algebra for Engineering	4
PC1433 Mechanics & Waves	4	MLE1010 Materials Engineering Principles & Practice	4
CS1010E Programming Methodology	4	GER1000 Quantitative Reasoning	4
GET	4	GEQ1000 Asking Questions	4
		Group A module for Second Major (UEM)	4
Sub-total	**20**	**Sub-total**	**24**

Semester 3	MCs	Semester 4	MCs
ESP2106 Principles of Continua	4	EG3301R DCP Project (UEM)	6
ESP2107 Numerical Methods & Statistics	4	PC2130B Applied Quantum Physics	4
PC2020 Electromagnetics for Electrical Engineers	4	PC2133 Applied Solid State Physics	4
PC2134 Mathematical Methods in Physics I	4	ESP2110 Design Project	4
Group B module for Second Major (UEM)	4	ES2531 Critical Thinking & Writing	4
Sub-total	**20**	**Sub-total**	**22**

Semester 5	MCs	Semester 6	MCs
EG3301R DCP Project (UEM)	6		
ESP Elective 1	4		
ESP Elective 2	4	NOC	
GES	4		
GEH	4		
Sub-total	**22**	**Sub-total**	

Semester 7	MCs	Semester 8	MCs
		ME2121 Engineering Thermodynamics & Heat Transfer	4
NOC		ESP Elective 3	4
		ESP Elective 4	4
		ESP Elective 5	4
Sub-total		**Sub-total**	**16**

Mapping of year-long NOC programmes:

NOC modules	*i*DP / Engineering modules
TR3201 Entrepreneurship Practicum (8 MCs)	EG2401A Engineering Professionalism (2 MCs) + ESP elective (4 MCs)
TR3202 Start-up Internship Programme (12 MCs)	EG3612 Vacation Internship Programme (6 MCs) + EG4301 DCP Dissertation (4 MCs out of 12 MCs)
TR3203N Start-up Case Study & Analysis (8 MCs)	EG4301 DCP Dissertation (8 MCs out of 12 MCs)
Entrepreneurship courses (up to 12 MCs)	Innovation & Enterprise electives (8 MCs – UEM)

(updated 7 June 2021)