

**Bachelor of Engineering (Biomedical 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:	
• BN1101 Engineering Principles & Practice I	6
• BN1102 Engineering Principles & Practice II	6
• MA1511 Engineering Calculus	2
• MA1512 Differential Equations for Engineering	2
• MA1513 Linear Algebra & Differential Equations	2
• PC1431 Physics IE	4
• CS1010E Programming Methodology	4
• CM1501 Organic Chemistry for Engineers	4
• BN2102 Bioengineering Data Analysis	4
• BN2201 Quantitative Physiology for Bioengineers	4
• BN2202 Introduction to Biotransport	4
• BN2204 Fundamentals of Biomechanics	4
• BN2301 Fundamental Biochemistry & Biomaterials for Bioengineers	4
• BN2403 Fundamentals of Biosignals Processing & Bioinstrumentation	4
BME technical electives ^{3,5}	30
BME design and project modules:	
• EG4301 DCP Dissertation <u>or</u> EG4301A Ideas to Start-up ³ (over 2 consecutive semesters) <i>(Double-counted for Second Major in Innovation & Design and replaces BN4101 B.Eng. Dissertation)</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
• EG3301R DCP Project ⁵ (over 2 consecutive semesters) <i>(replaces BN3101 Biomedical Engineering Design)</i>	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).

The 12 MCs for EG4301 are mapped by 8 MCs from BN4101 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 BN3101 (6 MCs).

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

– **JC-intake students or equivalent**

(for students with A-Level Physics)

Semester 1	MCs	Semester 2	MCs
CS1010E Programming Methodology	4	MA1512 Differential Equations for Engineering	2
CM1501 Organic Chemistry for Engineers	4	MA1513 Linear Algebra & Differential Equations	2
MA1511 Engineering Calculus	2	GER1000 Quantitative Reasoning	4
BN1101 Engineering Principles & Practice I	6	BN1102 Engineering Principles & Practice II	6
GET	4	PC1432 Physics IIE	4
		ES1531 Critical Thinking & Writing (double-counted)	4
		Group A module for Second Major (UEM)	4
Sub-total	20	Sub-total	26

Semester 3	MCs	Semester 4	MCs
BN2201 Quantitative Physiology for Bioengineers	4	EG3301R DCP Project (UEM)	6
BN2202 Introduction to Biotransport	4	BN2102 Bioengineering Data Analysis	4
BN2403 Fundamentals to Biosignals Processing & Bioinstrumentation	4	BN2204 Fundamentals of Biomechanics	4
GEQ1000 Asking Questions	4	BN2301 Fundamental Biochemistry & Biomaterials for Bioengineers	4
Group B module for Second Major (UEM)	4	EG2401A Engineering Professionalism	2
Sub-total	20	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 1 (UEM)	4
Technical Elective 1	4	Technical Elective 3	4
Technical Elective 2	4	Technical Elective 4	4
GES	4	Technical Elective 5	4
		GEH	4
Sub-total	18	Sub-total	20

Semester 7	MCs	Semester 8	MCs
EG4301 DCP Dissertation (double-counted)	6	EG4301 DCP Dissertation (double-counted)	6
Innovation & Enterprise Elective 2 (UEM)	4	Innovation & Enterprise Elective 3 (UEM)	4
Technical Elective 6	4	Technical Elective 8	2
Technical Elective 7	4		
Sub-total	18	Sub-total	12

Note:

The Group A module for Second Major may be completed in Semester 4 if students do not wish to overload in Semester 2.

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

– JC-intake students or equivalent

(for students without A-Level Physics)

Semester 1	MCs	Semester 2	MCs
CS1010E Programming Methodology	4	MA1512 Differential Equations for Engineering	2
CM1501 Organic Chemistry for Engineers	4	MA1513 Linear Algebra & Differential Equations	2
MA1511 Engineering Calculus	2	GER1000 Quantitative Reasoning	4
BN1101 Engineering Principles & Practice I	6	BN1102 Engineering Principles & Practice II	6
PC1221 Fundamentals of Physics I	4	PC1222 Fundamentals of Physics II	4
		Group A module for Second Major (UEM)	4
Sub-total	20	Sub-total	22

Semester 3	MCs	Semester 4	MCs
BN2201 Quantitative Physiology for Bioengineers	4	EG3301R DCP Project (UEM)	6
BN2202 Introduction to Biotransport	4	BN2102 Bioengineering Data Analysis	4
BN2403 Fundamentals to Biosignals Processing & Bioinstrumentation	4	BN2204 Fundamentals of Biomechanics	4
PC1432 Physics IIE	4	BN2301 Fundamental Biochemistry & Biomaterials for Bioengineers	4
GEQ1000 Asking Questions	4	ES1531 Critical Thinking & Writing (double-counted)	4
Group B module for Second Major (UEM)	4		
Sub-total	24	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
Technical Elective 1	4	Technical Elective 3	4
Technical Elective 2	4	Technical Elective 4	4
GET	4	GES	4
EG2401A Engineering Professionalism	2	GEH	4
Sub-total	20	Sub-total	20

Semester 7	MCs	Semester 8	MCs
EG4301 DCP Dissertation (double-counted)	6	EG4301 DCP Dissertation (double-counted)	6
Innovation & Enterprise Elective 2 (UEM)	4	Innovation & Enterprise Elective 3 (UEM)	4
Technical Elective 5	4	Technical Elective 7	4
Technical Elective 6	4	Technical Elective 8	2
Sub-total	18	Sub-total	16

Recommended semester schedule for Cohorts 2017/2018 and 2018/2019 – poly-intake students
(for students who are exempted from CS1010E and 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
PC1222 Fundamentals of Physics II (In lieu of EG3612)	4	MA1511 Engineering Calculus	2
CM1417 Fundamentals of Chemistry	4	MA1512 Differential Equations for Engineering	2
GET	4	PC1221 Fundamentals of Physics I	4
Group B module for Second Major (UEM)	4	PC1432 Physics IIE	4
		GER1000 Quantitative Reasoning	4
Sub-total	20	Sub-total	22

Semester 5	MCs	Semester 6	MCs
EG3301R DCP Project (UEM)	6	BN2102 Bioengineering Data Analysis	4
MA1513 Linear Algebra & Differential Equations	2	BN2204 Fundamentals of Biomechanics	4
CM1501 Organic Chemistry for Engineers	4	BN2301 Fundamental Biochemistry & Biomaterials for Bioengineers	4
BN2201 Quantitative Physiology for Bioengineers	4	GES	4
BN2202 Introduction to Biotransport	4	EG2401A Engineering Professionalism	2
GEQ1000 Asking Questions	4	ES1531 Critical Thinking & Writing (double-counted)	4
Sub-total	24	Sub-total	22

Semester 7	MCs	Semester 8	MCs
EG4301 DCP Dissertation (double-counted)	6	EG4301 DCP Dissertation (double-counted)	6
Innovation & Enterprise Elective 1 (UEM)	4	Innovation & Enterprise Elective 2 (UEM)	4
BN2403 Fundamentals to Biosignals Processing & Bioinstrumentation	4	Technical Elective 2	4
Technical Elective 1	4	Technical Elective 3	4
GEH	4	Technical Elective 4	4
Sub-total	22	Sub-total	22

Semester 9	MCs
Innovation & Enterprise Elective 3 (UEM)	4
Technical Elective 5	4
Technical Elective 6	4
Technical Elective 7	4
Technical Elective 8	2
Sub-total	18

Notes:

1. Poly-intake students may receive the following exemptions depending on their Diploma qualification:
 - BN1101 Engineering Principles & Practice I (6 MCs)
 - BN1102 Engineering Principles & Practice II (6 MCs)
 - CS1010E Programming Methodology (4 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/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.
3. EG3612 (VIP) is not compulsory for poly-intake students. The 6 MCs for VIP may be fulfilled by bridging modules such as MA1301 (4 MCs), PC1221 (4 MCs), PC1222 (4 MCs), CM1417 (4 MCs) and/or other modules.