

**Bachelor of Engineering (Materials Engineering)
Second Major in Medical Biology (AY2023-24)**

Last Update: 16-Nov-23

Academic Unit (AU) Required for graduation

Year of Study	Core	MPE	CC	FC	BDE	Total AU
1	25 / 26 ⁺	-	9	-	9	40 / 41 ⁺
2	16	-	8	3	9	36
3	16	-	-	12	3	31
4	18	9	-	-	9	36
	75 / 76 ⁺	9	17	15	30	146 / 147 ⁺

⁺Students without H2 Level Physics will take PH1012 (4 AU)

Year 1 (AY2023-24) - Semester 1

Course Code and Title	Course Type	AU
CC0003 Ethics & Civics in a Multi-Cultural World	CC	2
CC0005 Healthy Living & Wellbeing	CC	3
PH1011 Physics ^{*/**}	Core	3
MH1810 Mathematics I [*]	Core	3
MS1013 Materials Chemistry I [*]	Core	2
MS1016 Thermodynamics of Materials	Core	3
MS1017 Introduction to Materials Science	Core	2
BS1001 Introductory Biology	BDE	3
Total		21

** Students who obtained at least 3 'A's in H2 level subjects and at least grade 'E' or 'C6' in General Paper (GP) or Knowledge Inquiry (KI) will be eligible for exemption if a grade 'A' is obtained in the corresponding subject at H2 level.*

*** Students without H2 Level Physics will take PH1012 Physics A (4 AU)*

Year 1 (AY2023-24) - Semester 2

Course Code and Title	Course Type	AU
CC0001 Inquiry and Communication in the Interdisciplinary World	CC	2
CC0002 Navigating the Digital World	CC	2
EG1001 Engineer & Society	Core	2
MS1008 Introduction to Computational Thinking	Core	3
MS1014 Materials Chemistry II	Core	2
MS1018 Properties of Materials	Core	2
MS2013 Introduction to Polymer Science	Core	3
BS1005 Biochemistry I	BDE	3

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BS1007 Molecular and Cell Biology I	BDE	3
Total		22

Year 2 (AY2024-25) - Semester 1

Course Code and Title	Course Type	AU
CC0007 Science & Technology for Humanity	CC	3
MH2811 Mathematics II	Core	3
MS2012 Introduction to Manufacturing Processes	Core	3
MS2015 Mechanical Behaviour of Materials	Core	3
MS2016 Introduction to Metallurgy	Core	2
MS2083 Laboratory on Structure-Property Relationship in Polymers	Core	1
BS1012 Foundations of Chemistry I	BDE	3
Total		18

Year 2 (AY2024-25) - Semester 2

Course Code and Title	Course Type	AU
ML0004 Career and Entrepreneurial Development for the Future World	CC	2
CC0006 Sustainability: Society, Economy & Environment	CC	3
MS0003 Introduction to Data Science and Artificial Intelligence	FC	3
MS2014 Materials Structure and Defects	Core	3
MS2018 Electronic & Magnetic Properties of Materials	Core	3
MS2084 Phase Transformations and Kinetics in Steels	Core	1
BS2004 Molecular and Cell Biology II	BDE	3
BS3109 Fundamentals of Immunology	BDE	3
Total		21

Year 3 (AY2025-26) - Semester 1

Course Code and Title	Course Type	AU
HW0288 Effective Communication	FC	2
MS3011 Metallic & Ceramic Materials	Core	3
MS3012 Micro/Nanoelectronic Materials Processing	Core	3
MS3013 Electrochemical Corrosion	Core	3
MS3014 Analysis of Materials	Core	3
MS3082 Design Lab	Core	1

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BS1016 Physiology	BDE	3
Total		18

Year 3 (AY2025-26) - Semester 2

Course Code and Title	Course Type	AU
***MS3099 Professional Internship	FC	10
Total		10

*****MTMB students on PI will undergo PI in Y3 S2 because BS1016 Physiology is only offered in S1.

Year 4 (AY2026-27) - Semester 1

Course Code and Title	Course Type	AU
MS4089 Final Year Project	Core	4
MS3015 Industrial Design	Core	3
MS4012 Quality Control	Core	3
MS4013 Biomaterials	Core	2
MPE1	MPE	3
BSxxxx PE1	BDE	3
Total		18

Year 4 (AY2026-27) - Semester 2

Course Code and Title	Course Type	AU
MS4089 Final Year Project	Core	4
MS4014 Nanomaterials: Fundamentals and Applications	Core	2
MPE2	MPE	3
MPE3	MPE	3
BSxxxx PE2	BDE	3
BSxxxx PE3	BDE	3
Total		18
	Total AU for Graduation	146

Students have a choice of 3 electives (9AU) from the following list:

Course Code	Course Title	AUs	Semester	Course Typr
BS2003	Biochemistry II	3	1	BDE
BS2010	Bioimaging	3	2	BDE
BS3006	Bioentrepreneurship	3	2	BDE

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BS3013	Drug Discovery and Development, Biotechnology	3	2	BDE
BS3332	Undergraduate Advanced Experimental Biology (UAEB) Workshop (Series I) - Methods in Histology	3	2	BDE
BS3335	Undergraduate Advanced Experimental Biology (UAEB) Workshop (Series I) - Protein Behaviour in Health and Disease - Biophysical Tools	3	2	BDE
BS4010	Synthetic Biology	3	1	BDE
MS4610	Advanced Biomaterials	3	1	MPE^/BDE
MS4611	Biomedical Devices	3	2	MPE^/BDE
MS4612	Drug Delivery and Tissue Engineering	3	2	MPE^/BDE
MS4640	Advanced Analysis of Materials	3	1	MPE^/BDE

Student must meet all requirements of the principal Bachelor of Materials Engineering programme and fulfill the following condition:

Complete a Biomaterials-related Final Year Project

^Courses taken as MPE can be double-counted to fulfil the requirements of both the primary degree programme as well as the second major. See Table below for more information

Summary of Academic Unit Requirements for MTMB

Option	Core	MPE	ICC Common Core	ICC Foundation Core	BDE	Total
A) Maximum Double Counting Student takes all 3 electives as MPE.	75	9 [9]	17	15	21	137
B) Student takes 2 electives as MPE, 1 remaining elective as BDE.	75	9 [6]	17	15	24	140
C) Minimum Double Counting Student takes 1 elective as MPE, 2 remaining electives as BDE.	75	9 [3]	17	15	27	143
D) No Double Counting Student takes all 3 electives as BDE.	75	9	17	15	30	146

Note: [] indicates double-counted AU