

**Bachelor of Engineering (Materials Engineering)
Second Major in Pharmaceutical Engineering (AY2022-23)**

Academic Unit (AU) Required for graduation

Year of Study	Core	MPE	CC	FC	BDE	Total AU
1	25 / 26 ⁺	-	9	-	3	37 / 38 ⁺
2	20	-	8	3	9	40
3	15	-	-	12	6	33
4	15	9	-	-	12	36
	75 / 76 ⁺	9	17	15	30	146 / 147 ⁺

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

Year 1 - 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
MS1008 Introduction to Computational Thinking	Core	3
MS1017 Introduction to Materials Science	Core	2
Total		18

* 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 - 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
MS1014 Materials Chemistry II	Core	2
MS1018 Properties of Materials	Core	2
MS1016 Thermodynamics of Materials	Core	3
MS2013 Introduction to Polymer Science	Core	3
CH1104 Materials & Energy Balance	BDE	3
Total		19

Year 2 - 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
MS2014 Materials Structure and Defects	Core	3
MS2015 Mechanical Behaviour of Materials	Core	3
MS2016 Phase Transformation and Kinetics	Core	3
MS2018 Electronic & Magnetic Properties of Materials	Core	3
MS2083 Laboratory on Structure-Property Relationship in Polymers	Core	1
Total		22

Year 2 - 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
MS3082 Design Lab	Core	1
CH2112 Chemical Reaction Engineering	BDE	3
CH2114 Heat & Mass Transfer	BDE	3
CH2151 Unit Operations A	BDE	3
Total		18

Year 3 - 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 Corrosion of Materials	Core	3
MS3014 Analysis of Materials	Core	3
MS3015 Industrial Design	Core	3
CH3111 Process Control and Dynamics	BDE	3
CH3802 Chem Eng Lab	BDE	3
Total		23

Year 3 - Semester 2		
Course Code and Title	Course Type	AU
MS3099 Professional Internship	FC	10
Total		10

Year 4 - Semester 1		
Course Code and Title	Course Type	AU
MS4089 Final Year Project	Core	4
MS4013 Biomaterials	Core	2
MS4014 Nanomaterials: Fundamentals And Applications	Core	2
MPE1	MPE	3
CH4106 Formulation of Active Pharmaceutical Ingredients Dosage Forms	BDE	3
CH4306 Bioanalytical Techniques	BDE	3
Total		17

Year 4 - Semester 2		
Course Code and Title	Course Type	AU
MS4089 Final Year Project	Core	4
MS4012 Quality Control	Core	3
CH4213 Pharmacokinetics & Biopharmaceutics	BDE	3
CH4303 Bioseparations	BDE	3
MPE2	MPE	3
MPE3	MPE	3
Total		19
Total AU for Graduation		146