

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

Updated: 27-Jun-22

Academic Unit (AU) Required for graduation

Year of Study	Core	MPE	CC	FC	BDE	Total AU
1	25 / 26 ⁺	-	9	-	3	37 / 38 ⁺
2	16	-	8	3	11	38
3	24	-	-	7	9	40
4	10	9	-	-	12	31
	75 / 76 ⁺	9	17	10	35	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)

Pre-Req	Co-Req	Offered in		
		S1	S2	Both
		Y		
		Y		
				Y
				Y
		Y		
		Y		
		Y		

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

Pre-Req	Co-Req	Offered in		
		S1	S2	Both
			Y	
			Y	
			Y	
			Y	
			Y	
	MS1017			Y
	MS1014/MS1016			Y
			Y	

Year 2 - Semester 1

Course Code and Title	Course Type	AU
CC0007 Science & Technology for Humanity	CC	3
MS2012 Introduction to Manufacturing Processes	Core	3
MH2811 Mathematics II	Core	3
MS2014 Materials Structure and Defects	Core	3
MS2015 Mechanical Behaviour of Materials	Core	3
MS2016 Phase Transformation and Kinetics	Core	3
MS2083 Laboratory on Structure-Property Relationship in Polymers	Core	1
Total		19

Pre-Req	Co-Req	Offered in		
		S1	S2	Both
		Y		
				Y
	MH1810			Y
MS1017	MS1018			Y
				Y
	MS1016			Y
MS2013				Y

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

Pre-Req	Co-Req	Offered in		
		S1	S2	Both
			Y	
			Y	

MS0003 Introduction to Data Science and Artificial Intelligence	FC	3	MS1008	Y	
BDE1	BDE	2			
CH2112 Chemical Reaction Engineering	BDE	3			Y
CH2114 Heat & Mass Transfer	BDE	3			Y
CH2151 Unit Operations A	BDE	3			Y
Total		19			

Year 3 - Semester 1			Pre-Req	Co-Req	Offered in		
Course Code and Title	Course Type	AU			S1	S2	Both
HW0288 Effective Communication 2	FC	2					Y
MS2018 Electronic & Magnetic Properties of Materials	Core	3					Y
MS3011 Metallic & Ceramic Materials	Core	3		MS2016			Y
MS3012 Micro/Nanoelectronic Materials Processing	Core	3					Y
MS3082 Design Lab	Core	1					
CH3111 Process Control and Dynamics	BDE	3					Y
CH3802 Chem Eng Lab	BDE	3					Y
Total		18					

Year 3 - Semester 2			Pre-Req	Co-Req	Offered in		
Course Code and Title	Course Type	AU			S1	S2	Both
MS3014 Analysis of Materials	Core	3					Y
MS3013 Corrosion of Materials	Core	3		MS2013/MS3011			Y
MS3015 Industrial Design	Core	3	MS3082	MS2013/MS3011			Y
MS4012 Quality Control	Core	3					Y
MS4013 Biomaterials	Core	2	MS2013	MS3011			Y
BDE2	BDE	3					
Total		17					

Year 3 - Semester 2			Pre-Req	Co-Req	Offered in		
Course Code and Title	Course Type	AU			S1	S2	Both
MS3096 Professional Attachment	FC	5					Not Applicable
Total		5					

Year 4 - Semester 1			Pre-Req	Co-Req	Offered in		
Course Code and Title	Course Type	AU			S1	S2	Both
MS4089 Final Year Project	Core	4	Year 4 Standing				Not Applicable
MPE1	MPE	3					
MPE2	MPE	3					Not Applicable
CH4106 Formulation of Active Pharmaceutical Ingredients Dosage Forms	BDE	3					Y
CH4306 Bioanalytical Techniques	BDE	3					Y
Total		16					

Year 4 - Semester 2			Pre-Req	Co-Req	Offered in		
Course Code and Title	Course Type	AU			S1	S2	Both
MS4089 Final Year Project	Core	4	Year 4 Standing				Not Applicable
MS4014 Nanomaterials: Fundamentals And Applications	Core	2	MS2018/MS3012/MS3013				Y
MPE3	MPE	3					
CH4213 Pharmacokinetics & Biopharmaceutics	BDE	3					Y
CH4303 Bioseparations	BDE	3					Y
Total		15					
Total AU for Graduation		146					