

Bachelor of Engineering (Materials Engineering)

2nd Major in Pharmaceutical Engineering (AY2018-19)

Professional Attachment (PA) Option

ACADEMIC UNIT (AU) REQUIRED FOR GRADUATION

2nd Major in Pharmaceutical Engineering Programme	Year of Study	Core	Core Electives	GER			Unrestricted Electives		Total AU
				Core	Electives		PE [^]	DR*	
					BM	LA			
Year 1 Admission	1	33/34 ⁺	-	1	3		-	-	37/38 ⁺
	2	23	-	7	-	-	-	13	43
	3	21	6	6	-	-	-	6	41
	4	8	6	-	-	-	-	12	29
	All Years								

[^] *Pharmaceutical Engineering*

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

* *Degree Requirements*

Description of Abbreviation

BM – Business & Management

LA – Liberal Arts

STS – Science, Technology & Society

YEAR 1 2nd Major in Pharmaceutical Engineering – PA Option

Course Code and Title	Type	AU
YEAR 1 SEMESTER 1		
HW0001 English Proficiency		0
GC0001 Introduction to Sustainability: Multidisciplinary Approaches and Solutions	GER Core	1
MH1810 Mathematics I*	Core	3
MS1013 Materials Chemistry*	Core	3
MS1015 Materials Science	Core	3
PH1011 Physics***	Core	3
GER-PE (LA/BM)	GER Elective	3
TOTAL		16

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

* 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.

YEAR 1 SEMESTER 2		
MS1008 Introduction to Computational Thinking	Core	3
MS1012 Materials Physics	Core	3
MS1014 Materials Chemistry II	Core	3
MS1016 Thermodynamics of Materials	Core	3
MH2811 Mathematics II	Core	3
MS2012 Introduction to Manufacturing Processes	Core	3
MS2014 Materials Structure and Defects	Core	3
TOTAL		21

YEAR 2 2nd Major in Pharmaceutical Engineering – PA Option

Course Code and Title	Type	AU
YEAR 2 SEMESTER 1		
HY0001 Ethics and Moral Reasoning	GER Core	1
HW0188 Engineering Communication I	GER Core	2
MS2013 Polymers and Composites	Core	3
MS2015 Mechanical Behaviour of Materials	Core	3
MS2016 Phase Transformations and Kinetics	Core	3
MS2018 Electronic & Magnetic Properties of Materials	Core	3
MS2081 Laboratory IIA	Core	1
MS3011 Metallic & Ceramic Materials	Core	3
MS3013 Environmental Effects on Materials	Core	3
TOTAL		22

YEAR 2 SEMESTER 2		
MS2082 Laboratory IIB	Core	1
MS3014 Analysis of Materials	Core	3
MS0003 Introduction to Data Science and Artificial Intelligence	GER Core	3
ML0003 Kickstart your Career Success	GER Core	1
CH1104 Materials & Energy Balance	Unrestricted Elective (PE)	4
CH2114 Heat & Mass Transfer	Unrestricted Elective (PE)	3
CH2141 Unit Operation	Unrestricted Elective (PE)	3
CH2112 Chemical Reaction Engineering	Unrestricted Elective (PE)	3
TOTAL		21

YEAR 3 2nd Major in Pharmaceutical Engineering – PA Option

Course Code and Title	Type	AU
YEAR 3 SEMESTER 1		
ET0001 Enterprise and Innovation	GER Core	1
HW0288 Engineering Communication II	GER Core	2
MS3012 Micro/Nanoelectronic Materials Processing	Core	3
MS3015 Materials Aspects in Design	Core	3
MS3081 Laboratory III	Core	1
CH3111 Process Control and Dynamics	Unrestricted Elective (PE)	3
CH3802 Chem Eng Lab	Unrestricted Elective (PE)	3
UE1	Unrestricted Elective	2
TOTAL		18

YEAR 3 SEMESTER 2		
EG0001 Engineers & Society	GER Core	3
MS4012 Quality Control	Core	3
MS4013 Biomaterials	Core	3
MS4014 Nanomaterials: Fundamentals and Applications	Core	3
Major Prescribed Elective 1	Core Elective	3
Major Prescribed Elective 2	Core Elective	3
TOTAL		18

YEAR 3 SPECIAL SEMESTER		
MS3096 Professional Attachment	Core	5
TOTAL		5

YEAR 4 2nd Major in Pharmaceutical Engineering Programme – PA Option

Course Code and Title	Type	AU
YEAR 4 SEMESTER 1		
MS4089 Final Year Project	Core	4
Major Prescribed Elective 3	Core Elective	3
Major Prescribed Elective 4	Core Elective	3
CH4106 Formulation of Active Pharmaceutical Ingredients Dosage Forms	Unrestricted Elective (PE)	3
CH4306 Bioanalytical Techniques	Unrestricted Elective (PE)	3
TOTAL		16

YEAR 4 SEMESTER 2		
MS4089 Final Year Project	Core	4
CH4213 Pharmacokinetics & Biopharmaceutics	Unrestricted Elective (PE)	3
CH4303 Bioseparations	Unrestricted Elective (PE)	3
CH4305 Special Topics in Biotechnology	Unrestricted Elective (PE)	3
UE2	Unrestricted Elective	3
TOTAL		13