Bachelor of Engineering (Materials Engineering)

2nd Major in Pharmaceutical Engineering (AY2018-19)

Professional Internship (PI) Option

ACADEMIC UNIT (AU) REQUIRED FOR GRADUATION

2nd Major in Pharmaceutical Engineering Programme	Year of Study	Core	Major Prescribed Elective	GER				Unrestricted Electives	Total AU
				Core	Electives				
					BM	LA	STS	PE^	
Year 1 Admission	1	33/34+	-	1	3		-	-	37/38+
	2	23	-	9	-	-	-	13	45
	3	23	-	1	-	-	-	6	30
	4	11	12	3	-	-	-	12	38
	All Years								150/151+

^ *Pharmaceutical Engineering*

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

Description of Abbreviation

BM – Business & Management

LA – Liberal Arts

STS – Science, Technology & Society

YEAR 1 2nd Major in Pharmaceutical Engineering – PI 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 – PI 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		
HW0288 Engineering Communication II	GER Core	2
MS2082 Laboratory IIB	Core	1
MS3014 Analysis of Materials	Core	3
MS0003 Introduction to Data Science and Artifiial 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		**23**

YEAR 3 2nd Major in Pharmaceutical Engineering – PI Option

Course Code and Title	Type	AU
YEAR 3 SEMESTER 1		
ET0001 Enterprise and Innovation	GER Core	1
MS3012 Micro/Nanoelectronic Materials Processing	Core	3
MS3015 Materials Aspects in Design	Core	3
MS3081 Laboratory III	Core	1
MS4013 Biomaterials	Core	3
MS4014 Nanomaterials: Fundamentals and Applications	Core	3
CH3111 Process Control and Dynamics	Unrestricted Elective (PE)	3
CH3802 Chem Eng Lab	Unrestricted Elective (PE)	3
TOTAL		**20**

YEAR 3 SEMESTER 2		
MS3099 Professional Internship	Core	10
TOTAL		**10**

YEAR 4 2nd Major in Pharmaceutical Engineering – PI Option

Course Code and Title	Type	AU
YEAR 4 SEMESTER 1		
MS4012 Quality Control	Core	3
EG0001 Engineers & Society	GER Core	3
MS4089 Final Year Project	Core	4
Major Prescribed Elective 1	Core Elective	3
Major Prescribed Elective 2	Core Elective	3
CH4106 Formulation of Active Pharmaceutical Ingredients Dosage Forms	Unrestricted Elective (PE)	3
CH4306 Bioanalytical Techniques	Unrestricted Elective (PE)	3
TOTAL		**22**

YEAR 4 SEMESTER 2		
MS4089 Final Year Project	Core	4
Major Prescribed Elective 3	Core Elective	3
Major Prescribed Elective 4	Core Elective	3
CH4213 Pharmacokinetics & Biopharmaceutics	Unrestricted Elective (PE)	3
CH4303 Bioseparations	Unrestricted Elective (PE)	3
~~CH4305 Special Topics in Biotechnology~~	~~Unrestricted Elective (PE)~~	~~3~~
TOTAL		**16**