B.Eng (Hons) in Bioengineering with 2nd Major in Pharmaceutical Engineering

*with Professional Internship

AY2024 - 2025 Intake onwards (BEPE)

		Number of Academic Units (AU)							
Drogrammo	Year of	Major Red	quirement		sciplinary rative Core	Broadening			
Programme	Study	Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)	and Deepening Electives (BDE)	Total		
Bioengineering	1	21/22*		9		3	33/34*		
with Second	2	26		8	3	6	43		
Major in	3	13			12	6	31		
Pharmaceutical	4	17	6 [6]			15	32 [6]		
Engineering	Total	77/78*	6 [6]	17	15	24	139/140* [6]		

Category			AU	Total AU			
	CC0001 In	Core (University-level) equiry and Communication in the colinary World	2				
	CC0002 N	avigating the Digital World	2				
	CC0003 Et	thics & Civics in a Multi-Cultural World	2				
		ealthy Living & Wellbeing	3	17			
Interdisciplinary	CC0006 St	ustainability: Society, Economy & ent	3				
Collaborative	CC0007 Sc	cience & Technology for Humanity	3				
Core (ICC)	ML0004 C	Career and Entrepreneurial Development for e World	2				
		onal Core (College-level)					
		Engineering Communication	2	4.5			
	Intelligen	stroduction to Data Science and Artificial	3	15			
	1	rofessional Internship	10				
	1						
	BIE Core						
	EG1001	Engineers In Society	2				
	MH1810		3				
	PH1011*	Physics	3				
		Introduction to Chemical and Biomedical					
Major	CB1102	Engineering	1	21			
Requirement	CB1103	Organic Chemistry For Engineers	3	21			
	CB1117	Engineering Mathematics	4				
		Cellular & Molecular Biology for					
	BG1141	Bioengineers	3				
	BG1801	Bioengineering Lab 1A	1				
	BG1802	Bioengineering Lab 1B	1				

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		_		
Major Requirement BG2802 Bioengineering Lab 2B BG3102 Control in Biosystems BG3104 Biomedical Imaging BG3105 Biomedical Instrumentation BG3112 Cardiovascular Engineering BG3801 Bioengineering Lab 3 Machine Learning and Optimiza BG4104 Bioengineers BG4122 Medical Device Design BG4801 Final Year Project BIE Major Prescribed Electives (MPE) PE Compulsory Courses CH1104 Materials & Energy Balance Heat & Mass Transfer in Chemic				
			1	56
		•		
	BG3112	Cardiovascular Engineering	3	
	Bioengineering Lab 3	1		
		Machine Learning and Optimization for		
	BG4104	Bioengineers	3	
	BG4122	Medical Device Design	6	
	BG4801	Final Year Project	8	
	BIE Major	Prescribed Electives (MPE)		6^
	PE Compu	llsory Courses		
	CH1104	Materials & Energy Balance	3	
		Heat & Mass Transfer in Chemical &		
	ent BG2801 Bioengineering Lab 2A 1 BG2802 Bioengineering Lab 2B 1 BG3102 Control in Biosystems 3 BG3104 Biomedical Imaging 3 BG3105 Biomedical Instrumentation 3 BG3112 Cardiovascular Engineering 3 BG3801 Bioengineering Lab 3 1 Machine Learning and Optimization for 3 BG4104 Bioengineers 3 BG4102 Medical Device Design 6 BG4104 Bioengineers 3 BG4122 Medical Device Design 6 BG4801 Final Year Project 8 BIE Major Prescribed Electives (MPE) PE Compulsory Courses CH1104 Materials & Energy Balance 3 Heat & Mass Transfer in Chemical & CH2114 Biological Systems 3 CH2112 Chemical Reaction Engineering 3 CH2151 Unit Operations: Fluid-Solid Seperation 3 CH3111 Process Control & Dynamics 3 CH4303 Bioseparations 3 CH4213 Pharmacokinetics & Biopharmaceutics 3 Chemical & Biomolecular Engineering CH3802 Laboratory 5 CH4306 Bioanalytical Techniques 3			
Diagramia	CH2112	Chemical Reaction Engineering	medical Engineering 3 siology 3 dynamics 3 engineers 3 emputational Thinking 3 b 2A 1 b 2B 1 ems 3 ems 3 ementation 3 meering 3 b 3 1 and Optimization for 3 esign 6 ser in Chemical & 3 es (MPE) y Balance 3 esfer in Chemical & 3 es ser in Chemical & 3	
	BG2104 Electronics for Biomedical Engineering BG2110 Bioelectricity BG2111 Anatomy and Physiology BG2131 Biomaterials BG2142 Biological Thermodynamics BG2209 Mechanics for Bioengineers BG2211 Introduction to Computational Thinking BG2801 Bioengineering Lab 2A BG2802 Bioengineering Lab 2B BG3102 Control in Biosystems BG3104 Biomedical Imaging BG3105 Biomedical Instrumentation BG3112 Cardiovascular Engineering BG3801 Bioengineering Lab 3 BG4104 Bioengineers BG4105 Bioengineering Lab 3 BG4106 Bioengineers BG4107 Bioengineers BG4108 Bioengineers BG4109 Bioengineers BG4101 Bioengineers BG4101 Bioengineers BG4102 Medical Device Design BG4801 Final Year Project BIE Major Prescribed Electives (MPE) PE Compulsory Courses CH1104 Materials & Energy Balance Heat & Mass Transfer in Chemical & CH2114 Biological Systems CH2112 Chemical Reaction Engineering CH3111 Process Control & Dynamics CH3111 Process Control & Biopharmaceutics CH4213 Pharmacokinetics & Biopharmaceutics CH4303 Bioseparations CH4213 Pharmacokinetics & Biopharmaceutics CH4306 Bioanalytical Techniques Formulation of Active Pharmaceutical			
Bioengineering with Second CH3111 Major in CH2112 CH2112 CH2111			1 2	
	BG3801 Bioengineering Lab 3			
Major in				24
Major in Pharmaceutical	CH4303	Bioseparations	3	24
Major in Pharmaceutical Engineering	CH4303	Bioseparations Pharmacokinetics & Biopharmaceutics	3	24
Major in Pharmaceutical	CH4303 CH4213	Bioseparations Pharmacokinetics & Biopharmaceutics Chemical & Biomolecular Engineering	3	24
Major in Pharmaceutical Engineering	CH4303 CH4213 CH3802	Bioseparations Pharmacokinetics & Biopharmaceutics Chemical & Biomolecular Engineering Laboratory 5	3 3 3	24
Major in Pharmaceutical Engineering	CH4303 CH4213 CH3802	Bioseparations Pharmacokinetics & Biopharmaceutics Chemical & Biomolecular Engineering Laboratory 5 Bioanalytical Techniques	3 3 3	24
Major in Pharmaceutical Engineering	CH4303 CH4213 CH3802 CH4306	Bioseparations Pharmacokinetics & Biopharmaceutics Chemical & Biomolecular Engineering Laboratory 5 Bioanalytical Techniques Formulation of Active Pharmaceutical	3 3 3 3	24
Major in Pharmaceutical Engineering	CH4303 CH4213 CH3802 CH4306	Bioseparations Pharmacokinetics & Biopharmaceutics Chemical & Biomolecular Engineering Laboratory 5 Bioanalytical Techniques Formulation of Active Pharmaceutical	3 3 3 3	24

^{*}Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).

[^]Counted towards 2nd Major in PE requirement (total 6U)

	essional Internship							
Year 1 Semester 1 Course		Туре	AU	Year 1 S Course		emester 2	Туре	Α
CB1102	Introduction to Chemical and Biomedical	C	1	-	BG1103	Organic Chemistry For Engineers	C	
JB1102	Engineering							
BG1141	6,	С	3		CB1117	Engineering Mathematics	С	
BG1801	8 8	С	1		BG1802		С	
MH1810 PH1011		C	3 3		EG1001 CC0003	Engineers in Society Ethics & Civics in a Multi-Cultural World	C CC	
111011	or	C	3		CC0005	Healthy Living & Wellbeing	CC	
PH1012	Physics A (* For students without 'A' Level Physics)	С	4		CH1104	Materials & Energy Balance	BDE	
CC0001	Inquiry and Communication in the Interdisciplinary	CC	2					
	World							
CC0002	Navigating the Digital World	СС	2	*				
			15	16				•
	emester 1	_				emester 2	_	
Course	Anatomy and Physiology	Type	AU	_	Course	Signal Processing in Piecustems	Type	
BG2119 BG2131	Anatomy and Physiology Biomaterials	C C	3 3		BG2103 BG2104	Signal Processing in Biosystems Electronics for Biomedical Engineering	C C	
	Biological Thermodynamics	C	3		BG2104 BG2110	Bioelectricity	C	
BG2142		C	3		BG2110 BG2209	Mechanics for Bioengineers	C	
BG2801		C	1		BG2209 BG2802	Bioengineering Lab 2B	C	
CC0006	5	CC	3		CC0007	Science & Technology for Humanity	CC	
ML0004	Career and Entrepreneurial Development for the Future World	СС	2		CB0494	Introduction to Data Science and Artificial Intelligence	FC	
	rutule Wolla				CH2112	Chemical Reaction Engineering	BDE	
				_	CH2151	Unit Operations: Fluid-Solid Seperation	BDE	
			18					2
	emester 1	_				emester 2	_	
Course	Control in Biogratums	Type C	AU 3	_	Course BG3920	Drafaggianal Internahin	Type FC	
BG3102 BG3104	Control in Biosystems Biomedical Imaging	C	3		BG3920	Professional Internship	FC	
	Biomedical Infagring Biomedical Instrumentation	C	3					
	Cardiovascular Engineering	C	3					
BG3801		Č	1					
HW0288	Engineering Communication	FC	2					
CH3111	Process Control and Dynamics	BDE	3					
CH3802	Chem Eng Lab 5	BDE	3					
			21					•
	emester 1	Туре	AU		Year 4 Se	emester 2	Туре	,
				-	BG4122	Medical Device Design	C	
Course	Machine Learning and Optimization for		3		507122	sa.sai borioo booigii		
Course BG4104	Bioengineers	С	3					
Gourse 3G4104	Bioengineers Medical Device Design	C C	3		BG4801	Final Year Project	С	
Course 3G4104 3G4122	Bioengineers Medical Device Design	С			BG4801 CH2114	Final Year Project Heat and Mass Transfer	BDE	
3G4104 3G4122 3G4801	Bioengineers Medical Device Design Final Year Project	C C	3			· · · · · · · · · · · · · · · · · · ·		
3G4104 3G4122 3G4801 4CH4106	Bioengineers Medical Device Design Final Year Project Formulation of Active Pharmaceutical Ingredients	C C C	3 4		CH2114	Heat and Mass Transfer	BDE	
3G4104 3G4122 3G4801 CH4106	Bioengineers Medical Device Design Final Year Project Formulation of Active Pharmaceutical Ingredients Solid Dosage Form	C C C	3 4 3		CH2114	Heat and Mass Transfer	BDE	
3G4104 3G4122 3G4801 CH4106	Bioengineers Medical Device Design Final Year Project Formulation of Active Pharmaceutical Ingredients Solid Dosage Form Bioanalytical Techniques	C C C MPE	3 4 3 3		CH2114	Heat and Mass Transfer	BDE	

^{*}Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).