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

**with Professional Internship*

AY2024 - 2025 Intake onwards (BEPE)

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

Category			AU	Total AU
Interdisciplinary Collaborative Core (ICC)	**Common Core (University-level)**			17
	CC0001 Inquiry and Communication in the Interdisciplinary World		2	
	CC0002 Navigating the Digital World		2	
	CC0003 Ethics & Civics in a Multi-Cultural World		2	
	CC0005 Healthy Living & Wellbeing		3	
	CC0006 Sustainability: Society, Economy & Environment		3	
	CC0007 Science & Technology for Humanity		3	
	ML0004 Career and Entrepreneurial Development for the Future World		2	
	Foundational Core (College-level)			15
	HW0288 Engineering Communication		2	
	CB0494 Introduction to Data Science and Artificial Intelligence		3	
	BG3920 Professional Internship		10	
Major Requirement	**BIE Core**			21
	EG1001	Engineers In Society	2	
	MH1810	Math 1	3	
	PH1011*	Physics	3	
	CB1102	Introduction to Chemical and Biomedical Engineering	1	
	CB1103	Organic Chemistry For Engineers	3	
	CB1117	Engineering Mathematics	4	
	BG1141	Cellular & Molecular Biology for Bioengineers	3	
	BG1801	Bioengineering Lab 1A	1	
	BG1802	Bioengineering Lab 1B	1	

Major Requirement	BG2103	Signal Processing in Biosystems	3	56
	BG2104	Electronics for Biomedical Engineering	3	
	BG2110	Bioelectricity	3	
	BG2119	Anatomy and Physiology	3	
	BG2131	Biomaterials	3	
	BG2142	Biological Thermodynamics	3	
	BG2209	Mechanics for Bioengineers	3	
	BG2211	Introduction to Computational Thinking	3	
	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	
	BG4104	Machine Learning and Optimization for Bioengineers	3	
	BG4122	Medical Device Design	6	
	BG4801	Final Year Project	8	
	BIE Major Prescribed Electives (MPE)			6^
Bioengineering with Second Major in Pharmaceutical Engineering (BDEs)	**PE Compulsory Courses**			24
	CH1104	Materials & Energy Balance	3	
	CH2114	Heat & Mass Transfer in Chemical & 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	
	CH3802	Chemical & Biomolecular Engineering Laboratory 5	3	
	CH4306	Bioanalytical Techniques	3	
	CH4106	Formulation of Active Pharmaceutical Ingredients Dosage Forms	3	
Total				**139/140* [6]**

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

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

B.Eng. (Bioengineering) with 2nd Major in Pharmaceutical Engineering
Suggested Study Plan for AY2024-2025 intake (BEPE)
with Professional Internship

Year 1 Semester 1

Course		Type	AU
CB1102	Introduction to Chemical and Biomedical Engineering	C	1
BG1141	Cellular & Molecular Biology for Bioengineers	C	3
BG1801	Bioengineering Lab 1A	C	1
MH1810	Math 1	C	3
PH1011	Physics	C	3
	or		
PH1012	Physics A *(* For students without 'A' Level Physics)*	C	4
CC0001	Inquiry and Communication in the Interdisciplinary World	CC	2
CC0002	Navigating the Digital World	CC	2
			15

Year 1 Semester 2

Course		Type	AU
BG1103	Organic Chemistry For Engineers	C	3
CB1117	Engineering Mathematics	C	4
BG1802	Bioengineering Lab 1B	C	1
EG1001	Engineers in Society	C	2
CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
CC0005	Healthy Living & Wellbeing	CC	3
CH1104	Materials & Energy Balance	BDE	3
			18

Year 2 Semester 1

Course		Type	AU
BG2119	Anatomy and Physiology	C	3
BG2131	Biomaterials	C	3
BG2142	Biological Thermodynamics	C	3
BG2211	Introduction to Computational Thinking	C	3
BG2801	Bioengineering Lab 2A	C	1
CC0006	Sustainability: Society, Economy & Environment	CC	3
ML0004	Career and Entrepreneurial Development for the Future World	CC	2
			18

Year 2 Semester 2

Course		Type	AU
BG2103	Signal Processing in Biosystems	C	3
BG2104	Electronics for Biomedical Engineering	C	3
BG2110	Bioelectricity	C	3
BG2209	Mechanics for Bioengineers	C	3
BG2802	Bioengineering Lab 2B	C	1
CC0007	Science & Technology for Humanity	CC	3
CB0494	Introduction to Data Science and Artificial Intelligence	FC	3
CH2112	Chemical Reaction Engineering	BDE	3
CH2151	Unit Operations: Fluid-Solid Seperation	BDE	3
			25

Year 3 Semester 1

Course		Type	AU
BG3102	Control in Biosystems	C	3
BG3104	Biomedical Imaging	C	3
BG3105	Biomedical Instrumentation	C	3
BG3112	Cardiovascular Engineering	C	3
BG3801	Bioengineering Lab 3	C	1
HW0288	Engineering Communication	FC	2
CH3111	Process Control and Dynamics	BDE	3
CH3802	Chem Eng Lab 5	BDE	3
			21

Year 3 Semester 2

Course		Type	AU
BG3920	Professional Internship	FC	10
			10

Year 4 Semester 1

Course		Type	AU
BG4104	Machine Learning and Optimization for Bioengineers	C	3
BG4122	Medical Device Design	C	3
BG4801	Final Year Project	C	4
^CH4106	Formulation of Active Pharmaceutical Ingredients Solid Dosage Form	MPE	3
^CH4306	Bioanalytical Techniques	MPE	3
CH4303	Bioseparations	BDE	3
			19

Year 4 Semester 2

Course		Type	AU
BG4122	Medical Device Design	C	3
BG4801	Final Year Project	C	4
CH2114	Heat and Mass Transfer	BDE	3
CH4213	Pharmacokinetics and Biopharmaceutics	BDE	3
			13

	Total (AU)	**139**
		140*

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