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

with Professional Internship
AY2023 - 2024 Intake onwards (BESN)

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 Sustainability	1	21/22*		9		6	36/37*
	2	26		8	3	6	43
	3	13			12	3	28
	4	17	6			13	36
	Total	77/78*	6	17	15	28	143/144*

Category		AU	Total AU
Interdisciplinary Collaborative Core (ICC)	**Common Core (University-level)**		
	CC0001 Inquiry and Communication in the Interdisciplinary World	2	17
	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)		
	HW0288 Engineering Communication	2	15
	CB0494 Introduction to Data Science and Artificial Intelligence	3	
	BG3920 Professional Internship	10	
Major Requirement	**BIE Core**		
	EG1001^ Engineers In Society	2	16
	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	

Major Requirement	BG1141	Cellular & Molecular Biology for Bioengineers	3	
	BG1801	Bioengineering Lab 1A	1	
	BG1802	Bioengineering Lab 1B	1	
	BG2103	Signal Processing in Biosystems	3	
	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	61
	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
[2nd Major in Sustainability](#)	**Sustainability Compulsory Courses**			
	Choose 1 Course from EACH of the 5 Knowledge Area 1) PEOPLE EM5109 Environmental Issue & Sustainability (3AU) ES5006 Environmental Sustainability (3AU) HV5001 Introduction to Environmental Humanities 2) Planet ES5001 Natural Hazards and Society (3AU) ES5005 Environmental Earth System Science (3AU) ES5007 Climate and Climate Change (3AU)			

2nd Major in Sustainability	3) Profit AB0603 Social Entrepreneurship (3AU) HE5091 Principles of Economics (3AU) 4) Practice EG1001 Engineers in Society 5) Policy HU1002 Introduction to Urban Planning (3AU) HA1001 Introduction to International Relations and Foreign Policy (3AU) HA1003 Introduction to Public Administration and Public Policy (3AU)	12	28
	Interdisciplinary Project	3	
	Sustainability Electives	13	
Total			**143/144***

Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).
^Counted towards 2nd Major in sustainability requirement (total 2AU)

B.Eng. (Bioengineering) with 2nd Major in Sustainabilty
Suggested Study Plan for AY2023-2024 intake (BESN)
with Professional Internship

Year 1 Semester 1

Course		Type	AU
CB1102	Introduction to Chemical and Biomedical Engineering	C	1
BG1141	Fundamental Biology for Bioengineers	C	3
BG1801	Bioengineering Lab 1A	C	1
MH1810	Math 1	C	3
PH1011	Physics _or_	C	3
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
ES5001	Planet: Natural Hazards and Society	BDE	3
			18 *19

Year 1 Semester 2

Course		Type	AU
CB1103	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
	SN Elective 1	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
EM5109	People: Environmental Issue & Sustainability	BDE	3
			21

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
AB0603	Profit: Social Entrepreneurship	BDE	3
			22

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
	SN Elective 2	BDE	3
			18

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
	BIE PE 1	MPE	3
	BIE PE 2	MPE	3
	SN Elective 3	BDE	3
			19

Year 4 Semester 2

Course		Type	AU
BG4122	Medical Device Design	C	3
BG4801	Final Year Project	C	4
HA1003	Policy: Introduction to Public Administration and Public Policy	BDE	3
	Interdisplinary Project	BDE	3
	SN Elective 3	BDE	4
			17
	Total (AU)		**143**
			144*

*Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).
^EG1001 is counted towards fulfilling the 'Practice' Knowledge Area for their 2nd Major in Sustainability