

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

with Professional Internship

AY2022 - 2023 Intake onwards

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	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	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	
Interdisciplinary Collaborative Core (ICC)	ML0004 Career and Entrepreneurial Development for the Future World	2	
	Foundational Core (College-level)		
Major Requirement	HW0288 Engineering Communication	2	15
	CB0494 Introduction to Data Science and Artificial Intelligence	3	
	BG3880 Professional Internship	10	
Major Requirement	BIE Core		16
	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	

Major Requirement	BG1141	Fundamental Biology for Bioengineers	3	61
	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	
	BG2801	Bioengineering Lab 2A	1	
	BG2802	Bioengineering Lab 2B	1	
	BG3102	Control in Biosystems	3	
	BG3104	Biomedical Imaging	3	
	BG3105	Biomedical Instrumentation	3	
	BG3112	Biofluid Mechanics and Medical Devices	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			
	<i>Choose 1 Course from EACH of the 5 Knowledge Area</i> 1) PEOPLE EM5109 Environmental Issue & Sustainability (3AU) ES5006 Environmental Sustainability (3AU) HV5001 Introduction to Environmental Humanities (3AU) 2) Planet ES5001 Natural Hazards and Society (3AU) ES5005 Environmental Earth System Science (3AU) ES5007 Climate and Climate Change (3AU)		6	

2nd Major in Sustainability	3) Profit AB0603 Social Entrepreneurship (3AU) HE5091 Principles of Economics (3AU)	8	30
	4) Practice EG1001 Engineers in Society (2AU)		
	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)		
	Interdisciplinary Project	3	
	Sustainability Electives Choose 3- 4 courses from the list of electives (min. 12 AUs) https://www.ntu.edu.sg/ase/admissions/undergraduate-programmes/second-major-in-sustainability#Content_C002_Col00	13	
Total			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

B.Eng. (Bioengineering) with 2nd Major in Sustainability			
Suggested Study Plan for AY2022-2023 intake (BESN)			
<u>with Professional Internship</u>			
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	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 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	
SN Elective 1	BDE	3	
		21	
Year 3 Semester 1			
Course	Type	AU	
BG3102 Control in Biosystems	C	3	
BG3104 Biomedical Imaging	C	3	
BG3105 Biomedical Instrumentation	C	3	
BG3112 Biofluid Mechanics and Medical Devices	C	3	
BG3801 Bioengineering Lab 3	C	1	
HW0288 Engineering Communication	FC	2	
SN Elective 2	BDE	3	
		18	
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 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	
EM5109 People: Environmental Issue & Sustainability	BDE	3	
		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	
AB0603 Profit: Social Entrepreneurship	BDE	3	
		22	
Year 3 Semester 2			
Course	Type	AU	
BG3880 Professional Internship	FC	10	
		10	
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	
Interdisciplinary 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