B.Eng (Hons) in Chemical and Biomolecular Engineering with 2nd Major in Sustainability (CHSN)

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)		
Chemical & Biomolecular Engineering with Second Major in Sustainability	1	24/25*		9		6	39/40*
	2	28		8	3	6	45
	3	17			12		29
	4	8	6			16	30
	Total	77/78*	6	17	15	28	143/144*

Category			AU	Total AU
Interdisciplinary Collaborative Core (ICC)	**Common Core (University-level)**			17
	CC0001	Inquiry and Communication in the Interdisciplinary	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	
	BG3880	Professional Internship	10	
Major Requirement	**CBE 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	CB1131	Introduction to Biomolecular Engineering	3	61
	CH1104	Materials & Energy Balance	3	
	CH1801	Chemical & Biomolecular Engineering Laboratory 1A	1	
	CH1802	Chemical & Biomolecular Engineering Laboratory 2	1	
	CH2010	Engineering Statistics	3	
	CH2103	Fluid Systems	3	
	CH2107	Introduction to Computational Thinking	3	
	CH2108	Thermodynamics	3	
	CH2112	Chemical Reaction Engineering	3	
	CH2114	Heat & Mass Transfer in Chemical and Biological Systems	3	
	CH2123	Chemical Thermodynamics	3	
	CH2151	Unit Operations: Fluid-Solid Seperation	3	
	CH2801	Chemical & Biomolecular Engineering Laboratory 2A	2	
	CH2802	Chemical & Biomolecular Engineering Laboratory 2B	2	
	CH3104	Biochemical Engineering	3	
	CH3109	Decision Tools for Business & Engineering	3	
	CH3111	Process Control and Dynamics	3	
	CH3121	Chemical, Biological & Plant Safety	2	
	CH3140	Unit Operations: Fluid-Fluid Separation	3	
	CH3802	Chemical & Biomolecular Engineering Laboratory 5	3	
	CH4801	Final Year Design Project	8	
	CBE Major Prescribed Electives (MPE)			6
2nd Major in Sustainbility	**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 (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 Sustainbility	3) Profit AB0603 Social Entrepreneurship (3AU) HE5091 Principles of Economics (3AU) 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)	8	30
	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. (Chemical & Biomolecular Engineering) with 2nd Major in Sustainability
Suggested Study Plan for AY2022-2023 intake (BESN)
with Professional Internship

Year 1 Semester 1

Course		Type	AU
CB1102	Introduction to Chemical and Biomedical Engineering	C	1
CB1131	Introduction to Biomolecular Engineering	C	3
CH1801	Chemical & Biomolecular Engineering Laboratory 1A	C	1
MH1810	Math 1	C	3
PH1011	Physics	C	3
	or		
PH1012	Physics A *(* For students without 'A' Level Physics)*		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
CH1104	Materials & Energy Balance	C	3
CH1802	Chemical & Biomolecular Engineering Laboratory 2	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
			21

Year 2 Semester 1

Course		Type	AU
CH2103	Fluid Systems	C	3
CH2107	Introduction to Computational Thinking	C	3
CH2108	Thermodynamics	C	3
CH2010	Engineering Statistics	C	3
CH2801	Chemical & Biomolecular Engineering Laboratory 2A	C	2
CC0006	Sustainability: Society, Economy & Environment	CC	3
ML0004	Career and Entrepreneurial Development for the Future World	CC	2
	SN Elective 1	BDE	3
			22

Year 2 Semester 2

Course		Type	AU
CH2112	Chemical Reaction Engineering	C	3
CH2114	Heat & Mass Transfer in Chemical and Biological Systems	C	3
CH2123	Chemical Thermodynamics	C	3
CH2151	Unit Operations: Fluid-Solid Seperation	C	3
CH2802	Chemical & Biomolecular Engineering Laboratory 2B	C	2
CC0007	Science & Technology for Humanity	CC	3
CB0494	Introduction to Data Science and Artificial Intelligence	FC	3
AB0603	Profit: Social Entrepreneurship	BDE	3
			23

Year 3 Semester 1

Course		Type	AU
CH3104	Biochemical Engineering	C	3
CH3109	Decision Tools for Business & Engineering	C	3
CH3111	Process Control and Dynamics	C	3
CH3121	Chemical, Biological & Plant Safety	C	2
CH3140	Unit Operations: Fluid-Fluid Separation	C	3
CH3802	Chemical & Biomolecular Engineering Laboratory 5	C	3
HW0288	Engineering Communication	FC	2
			19

Year 3 Semester 2

Course		Type	AU
CH3880	Professional Internship	FC	10
			10

Year 4 Semester 1

Course		Type	AU
CH4801	Final Year Design Project	C	4
	CBE PE 1	MPE	3
	CBE PE 2	MPE	3
	SN Elective 2	BDE	3
	SN Elective 3	BDE	3
			16

Year 4 Semester 2

Course		Type	AU
CH4801	Final Year Design Project	C	4
HA1003	Policy: Introduction to Public Administration and Public Policy	BDE	3
	Interdisplinary Project	BDE	3
	SN Elective 3	BDE	4
			14
	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