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

<u>with Professional Internship</u> AY2022 - 2023 Intake onwards

Programme		Number of Academic Units (AU)						
	Year of	Major Requirement		Interdisciplinary Collaborative Core		Broadening and		
	Study	Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)	Deepening Electives (BDE)	Total	
Chemical &	1	24/25*		9		6	39/40*	
Biomolecular	2	28		8	3	6	45	
Engineering	3	17			12		29	
with Second	4	8	6			16	30	
Major in Sustainability	Total	77/78*	6	17	15	28	143/144*	

Category			AU	Total AU	
	Common	Core (University-level)			
Interdisciplinary Collaborative Core (ICC)	CC0001 In	quiry and Communication in the Interdisciplinary	2		
	CC0002 Na	avigating the Digital World	2		
	CC0003 Et	hics & Civics in a Multi-Cultural World	2		
	CC0005 He	ealthy Living & Wellbeing	3	17	
	CC0006 Su	stainability: Society, Economy & Environment	3	1/	
	CC0007 Sc	ience & Technology for Humanity	3		
Collaborative	ML0004 Ca Future Wo	2			
	Foundatio	nal Core (College-level)			
	1	2			
	1	Ingineering Communication troduction to Data Science and Artificial	۷		
	Intelligenc	3	15		
	1	rofessional Internship	10		
				L	
	CBE Core				
Interdisciplinary Collaborative	EG1001^	Engineers In Society	2		
	MH1810	Math 1	3		
Major	PH1011*	Physics	3	16	
Requirement	CB1102	Introduction to Chemical and Biomedical Engineering	1		
	CB1103	Organic Chemistry For Engineers	3		
	CB1117	Engineering Mathematics	4		

	CH1801	Chemical & Biomolecular Engineering Laboratory 1A Chemical & Biomolecular Engineering Laboratory 2 H2010 Engineering Statistics H2103 Fluid Systems H2107 Introduction to Computational Thinking H2108 Thermodynamics H2112 Chemical Reaction Engineering H2114 Systems H2123 Chemical Thermodynamics H21215 Unit Operations: Fluid-Solid Seperation Chemical & Biomolecular Engineering Laboratory 2A Chemical & Biomolecular Engineering Laboratory 2B H3104 Biochemical Engineering H3111 Process Control and Dynamics H3111 Chemical & Biomolecular Engineering Laboratory 5 Final Year Design Project  BE Major Prescribed Electives (MPE)  M5109 Environmental Issue & Sustainability (3AU) W5001 Introduction to Environmental Humanities (3AU)  Planet S5001 Natural Hazards and Society (3AU)		
	CH1802	Chemical & Biomolecular Engineering	1	
	CH2010			
		•		
	1	•		
	CH2114	Heat & Mass Transfer in Chemical and Biological	3 1 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 4 4 5 6 6 6	
	CH2123	Chemical Thermodynamics	3	
Major	CH2151	Unit Operations: Fluid-Solid Seperation	Ting 1 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	
Major Requirement	CH2801	Laboratory 2A	2	61
	CH2802		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	9 9	3	
	CH4801	CH2123 Chemical Thermodynamics CH2151 Unit Operations: Fluid-Solid Seperation Chemical & Biomolecular Engineering Laboratory 2A Chemical & Biomolecular Engineering Laboratory 2B CH3104 Biochemical Engineering CH3109 Decision Tools for Business & Engineering CH3111 Process Control and Dynamics CH3121 Chemical, Biological & Plant Safety CH3140 Unit Operations: Fluid-Fluid Separation CH3802 Chemical & Biomolecular Engineering CH3802 Chemical & Biomolecular Engineering Laboratory 5 CH4801 Final Year Design Project  CBE Major Prescribed Electives (MPE)		
i	CH1801 Chemical & Biomolecular Engineering Laboratory 1A  CH1802 Chemical & Biomolecular Engineering Laboratory 2  CH2010 Engineering Statistics CH2103 Fluid Systems CH2107 Introduction to Computational Thinking CH2108 Thermodynamics CH2110 Chemical Reaction Engineering Heat & Mass Transfer in Chemical and Biological Systems CH2121 Chemical Thermodynamics CH2114 Systems CH2123 Chemical Thermodynamics CH2151 Unit Operations: Fluid-Solid Seperation CH2801 Chemical & Biomolecular Engineering Laboratory 2A Chemical & Biomolecular Engineering Laboratory 2B CH3104 Biochemical Engineering CH3109 Decision Tools for Business & Engineering CH3111 Process Control and Dynamics CH3121 Chemical, Biological & Plant Safety CH3140 Unit Operations: Fluid-Fluid Separation CH3802 Chemical & Biomolecular Engineering Laboratory 5 CH3801 Final Year Design Project  CBE Major Prescribed Electives (MPE)  Sustainability Compulsory Courses Choose 1 Course from EACH of the 5 Knowledge Area  1) PEOPLE EM5109 Environmental Issue & Sustainability (3AU) ES5006 Environmental Sustainability (3AU)			
	CBE Majo	r Prescribed Electives (MPE)		6
	· · · · ·	` '		6
	Sustainab	oility Compulsory Courses		6
	Sustainab	oility Compulsory Courses		6
	Sustainab	course from EACH of the 5 Knowledge Area		6
2nd Major in	Sustainab Choose 1  1) PEOPLE EM5109 E	Course from EACH of the 5 Knowledge Area  Environmental Issue & Sustainability (3AU)		6
2nd Major in Sustainbility	Sustainab Choose 1 1) PEOPLE EM5109 E ES5006 En	Course from EACH of the 5 Knowledge Area Environmental Issue & Sustainability (3AU) Environmental Sustainability (3AU)	6	6
· ·	Sustainab Choose 1 1) PEOPLE EM5109 E ES5006 En	Course from EACH of the 5 Knowledge Area Environmental Issue & Sustainability (3AU) Environmental Sustainability (3AU)	6	6
-	Sustainab Choose 1 1) PEOPLE EM5109 E ES5006 En	Course from EACH of the 5 Knowledge Area Environmental Issue & Sustainability (3AU) Environmental Sustainability (3AU)	6	6
· ·	Sustainab Choose 1 1) PEOPLE EM5109 E ES5006 En HV5001 In 2) Planet ES5001 N	Course from EACH of the 5 Knowledge Area Environmental Issue & Sustainability (3AU) Invironmental Sustainability (3AU) Introduction to Environmental Humanities (3AU) atural Hazards and Society (3AU)	6	6

Sus Cho htt pro	rogrammes/second-major-in- ustainability#Content_C002_Col00)	13	143/144*
Sus Cho htt pro	rogrammes/second-major-in-	13	
	noose 3- 4 courses from the list of electives (min. 12 AUs) etps://www.ntu.edu.sg/ase/admissions/undergraduate-	13	
	terdisciplinary Project ustainability Electives	3	
Sustainbility HA	oreign Policy (3AU) A1003 Introduction to Public Administration and Public olicy (3AU)		
HU	Policy U1002 Introduction to Urban Planning (3AU) A1001 Introduction to International Relations and		
1 '	Practice G1001 Engineers in Society (2AU)	8	30
AB	Profit B0603 Social Entrepreneurship (3AU) E5091 Principles of Economics (3AU)		

<sup>\*</sup>Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).

<sup>^</sup>EG1001 is counted towards fulfilling the 'Practice' Knowledge Area for their 2nd Major in Sustainability

Year 1 Ca	emester 1			Voor 1 C	emester 2		
Year 1 Semester 1 Course		Туре	AU	Course	emester z	Туре	Αl
CB1102	Introduction to Chemical and Biomedical	С	1	CB1103	Organic Chemistry For Engineers	С	:
CB1131	Engineering Introduction to Biomolecular Engineering	С	3	CB1117	Engineering Mathematics	С	
	Chemical & Biomolecular Engineering						
CH1801	Laboratory 1A	С	1	CH1104	Materials & Energy Balance	С	
MH1810	Math 1	С	3	CH1802	Chemical & Biomolecular Engineering	С	
PH1011	Physics	С	3	EG1001	Laboratory 2 Engineers in Society	С	
111011	<u>or</u>	Ü	Ü	CC0003	Ethics & Civics in a Multi-Cultural World	CC	
PH1012	Physics A (* For students without 'A' Level Physics)		4	CC0005	Healthy Living & Wellbeing	CC	
CC0001	Inquiry and Communication in the	СС	2	EM5109	People: Environmental Issue &	BDE	
CC0002	Interdisciplinary World	CC	2		Sustainability		
ES5001	Navigating the Digital World  Planet: Natural Hazards and Society	BDE	3				
	, and the same of						
			18				2
Year 2 Se Course	emester 1	Tumo	A11		emester 2	Time	
CH2103	Fluid Systems	<b>Type</b> C	<b>AU</b> 3	Course CH2112	Chemical Reaction Engineering	Type C	
CH2107	Introduction to Computational Thinking	С	3	CH2114	Heat & Mass Transfer in Chemical and	С	
	·				Biological Systems		
CH2108 CH2010	Thermodynamics Engineering Statistics	C C	3 3	CH2123 CH2151	Chemical Thermodynamics Unit Operations: Fluid-Solid Seperation	C C	
	Chemical & Biomolecular Engineering				Chemical & Biomolecular Engineering		
CH2801	Laboratory 2A	С	2	CH2802	Laboratory 2B	С	
CC0006	Sustainability: Society, Economy &	СС	3	CC0007	Science & Technology for Humanity	CC	
	Environment Career and Entrepreneurial Development for				Introduction to Data Science and Artificial		
ML0004	the Future World	CC	2	CB0494	Intelligence	FC	
	SN Elective 1	BDE	3	AB0603	Profit: Social Entrepreneurship	BDE	
			22	-			2
Year 3 Se	emester 1			Year 3 So	emester 2		
Course		Type	AU	Course		Type	Α
CH3104	Biochemical Engineering	С	3	CH3880	Professional Internship	FC	•
CH3109 CH3111	Decision Tools for Business & Engineering Process Control and Dynamics	C C	3 3				
CH3111	Chemical, Biological & Plant Safety	C	2				
CH3140	Unit Operations: Fluid-Fluid Separation	Č	3				
CH3802	Chemical & Biomolecular Engineering	С	3				
	Laboratory 5		_				
HW0288	Engineering Communication	FC	2				
			19				1
Year 4 Se	emester 1			Year 4 So	emester 2		
Course		Туре	AU	Course	· · <del>-</del>	Туре	A
CH4801	Final Year Design Project	С	4	CH4801	Final Year Design Project	С	
	CBE PE 1	MPE	3	HA1003	Policy: Introduction to Public Administration and Public Policy	BDE	
	CBE PE 2	MPE	3	1141003	Interdisplinary Project	BDE	
	SN Elective 2	BDE	3		SN Elective 3	BDE	
	SN Elective 3	BDE	3		ON LIEUWE 3	DDL	
			16				
			10		T-4-1 (A11)		1
					Total (AU)		

<sup>\*</sup>Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).
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