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

## with Professional Internship

AY2024 - 2025 Intake onwards (CBFF)

		Number of Academic Units (AU)								
Programme  Chemical & Biomolecular Engineering with Second Major in FF_ Track 1 (Global	Year of	Major Requirement			ciplinary ative Core	Broadening and				
Programme	Study	Core (C)	Major PE (MPE)	Common Core (CC)	Foundation al Core (FC)	Deepening Electives (BDE)	Total			
Chemical &	1	24		9			33			
	2	30	3 [3]	8	3	3	47			
Second Major in	3				10	12	22			
_	4	23	3 [3]		2	9	37			
Immersion in WUR)	Total	77	6 [6]	17	15	24	139			

140\*

Programme	Year of Study	Number of Academic Units (AU)							
		Major Requirement		Interdis	ciplinary	Broadening			
Programme		Core (C)	Major PE (MPE)	Common Core (CC)	Foundation al Core (FC)	and	Total		
	1	24		9			33		
Chemical & Biomolecular	2	28	3 [3]	8	3	3	45		
Engineering with Second	3	17			12		29		
Major in	4	8	3 [3]			21	32		
FF_Track 2 (NTU Based)	Total	77	6 [6]	17	15	24	139		

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

## with Professional Internship

AY2024 - 2025 Intake onwards (CBFF)

Category	make onwards (ODIT)	AU	Total AU
	Common Core (University-level)		
	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	17
Interdisciplinary Collaborative	CC0006 Sustainability: Society, Economy & Environment	3	
	CC0007 Science & Technology for Humanity	3	
Core (ICC)	ML0004 Career and Entrepreneurial Development for the Future World	2	
	Foundational Core (College-level)	<u> </u>	
	HW0288 Engineering Communication	2	
	CB0494 Introduction to Data Science and Artificial Intelligence	3	15
	CH3920 Professional Internship	10	
	CBE Core		
	EG1001 Engineers In Society MH1810 Math 1 PH1011* Physics	2 3 3	
	CB1102 Introduction to Chemical and Biomedical Engineering	1	
Major	CB1103 Organic Chemistry For Engineers CB1117 Engineering Mathematics CB1131 Introduction to Biomolecular Engineering	3 4 3	36
Requirement	CH1104 Materials & Energy Balance	3	
	CH1801 Chemical & Biomolecular Engineering Laboratory 1A	1	
	CH1802 Chemical & Biomolecular Engineering Laboratory	2 1	
	CH2010 Engineering Statistics CH2103 Fluid Systems CH2107 Introduction to Computational Thinking CH2108 Thermodynamics	3 3 3 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	41
Major	CH3109	Decision Tools for Business & Engineering	3	
Requiremen	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	
	1	r Prescribed Electives (MPE)		
		Food Standard - Food Safety & Risk Assessment	3^	6
	CH5222^	Future Foods - Introduction to Advanced Meat	3^	-
	FF Core C	Courses		
	CH5210	Food Process Technologies and New Production Systems	3	
	CH5211	Data Analytics in Food Systems	3	
2nd Major in	CH5220^	Food Standard - Food Safety & Risk Assessment	paration 3 eering Laboratory 5 3 8 Risk Assessment 3^ 6 d New Production 3 Risk Assessment - 3 Risk Assessment -	
Future Foods	CH5222^	Future Foods - Introduction to Advanced Meat	-	24
(BDEs)	CM5101	Food Chemistry & Nutrition	3	
	Electives	(Choose 5, min 15AU)		
		ectives (Track 1) or 4 NTU Elective (Track 2)	12	
	1 NTU Ele	ective	3	
Total	1		I	420
Total				139 140*

<sup>140\*</sup> 

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

<sup>^</sup>Counted towards 2nd Major in FF requirement (total 6AU)

<sup>[]</sup> AU of courses that could be used to fulfil Core/MPE requirment and 2nd Major requirment concurrently

Suggester	hemical & Biomolecular Engineering) with 2nd N	lajor in Fu	ture Foods				
Frack 1 (G	d Study Plan for AY2024-2025 intake (CHFS) Global Immersion in WUR) ssional Internship						
Year 1 Se	<del></del>			Year 1 Se	mester 2		
Course		Туре	AU	Course		Туре	AU
CB1102	Introduction to Chemical and Biomedical Engineering	С	1	CB1103	Organic Chemistry For Engineers	С	3
CB1131	Introduction to Biomolecular Engineering	С	3	CB1117	Engineering Mathematics	С	4
CH1801	Chemical & Biomolecular Engineering Laboratory 1A	С	1	CH1104	Materials & Energy Balance	С	3
MH1810	Math 1	С	3	CH1802	Chemical & Biomolecular Engineering Laboratory 2	С	1
PH1011	Physics <u>or</u>	С	3	EG1001 CC0003	Engineers in Society Ethics & Civics in a Multi-Cultural World	C CC	2
PH1012	Physics A (* For students without 'A' Level Physics)		4	CC0005	Healthy Living & Wellbeing	CC	3
CC0001	Inquiry and Communication in the Interdisciplinary World	СС	2				
CC0002	Navigating the Digital World	CC	2 *				
			15 16				18
Year 2 Se	mester 1			Year 2 Se	mester 2		
Course		Туре	AU	Course		Туре	Αl
CH2103	Fluid Systems	C	3	CH2112	Chemical Reaction Engineering	C	3
CH2107	Introduction to Computational Thinking	С	3	CH2114	Heat & Mass Transfer in Chemical and Biological Systems	С	3
CH2108	Thermodynamics	С	3	CH2123	Chemical Thermodynamics	С	3
CH2010	Engineering Statistics	С	3	CH2151	Unit Operations: Fluid-Solid Seperation	С	3
CH2801	Chemical & Biomolecular Engineering Laboratory 2A	С	2	CH2802	Chemical & Biomolecular Engineering Laboratory 2B	С	2
CH3121	Chemical, Biological & Plant Safety	С	2	CC0007	Science & Technology for Humanity	CC	3
CC0006	Sustainability: Society, Economy & Environment	CC	3	CB0494	Introduction to Data Science and Artificial Intelligence	FC	3
ML0004	Career and Entrepreneurial Development for the Future World	CC	2	^CH5220	Food Standard - Food Safety and Risk Assessment	MPE	3
	Food Chemistry & Nutrition	BDE	3				
CM5101	, 						
CIVIO TUT			24				2:
Year 3 Se	mester 1	Tuna		Year 3 Ser	mester 2	Tuna	
Year 3 Se		Type	AU	Course		Type	Al
Year 3 Se	FF WUR Elective 1	BDE	<b>AU</b> 3		mester 2 Professional Internship	<b>Type</b> FC	A
Year 3 Se	FF WUR Elective 1 FF WUR Elective 2		<b>AU</b> 3 3	Course			A
/ear 3 Se	FF WUR Elective 1	BDE BDE	<b>AU</b> 3	Course			A
/ear 3 Se	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3	BDE BDE BDE	<b>AU</b> 3 3 3 3	Course			<b>A</b> l
ear 3 Se Course	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4	BDE BDE BDE	<b>AU</b> 3 3 3 3 3	Course	Professional Internship		<b>A</b> l
Year 3 Se Course Year 4 Se Course	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4  mester 1	BDE BDE BDE BDE BDE	AU 3 3 3 3 3 3 12	Course CH3920  Year 4 Sei Course	Professional Internship mester 2	FC Type	10 10
Year 3 Se Course Year 4 Se Course CH3104	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4  mester 1  Biochemical Engineering	BDE BDE BDE BDE Type	AU 3 3 3 3 3 12 AU 3	Course CH3920  Year 4 Se Course CH4801	Professional Internship  mester 2  Final Year Design Project	Type C	10 10 Al
Year 4 Se Course Course CH3104 CH3109	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4  mester 1  Biochemical Engineering Decision Tools for Business & Engineering	BDE BDE BDE BDE Type C C	AU 3 3 3 3 3 12 AU 3 3 3 3 3	Course CH3920  Year 4 Set Course CH4801 HW0288	Professional Internship  mester 2  Final Year Design Project Engineering Communication	Type C FC	1 A A 4 2 2
Year 4 Se Course Course CH3104 CH3109	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4  mester 1  Biochemical Engineering	BDE BDE BDE BDE Type	AU 3 3 3 3 3 12 AU 3	Course CH3920  Year 4 Se Course CH4801	Professional Internship  mester 2  Final Year Design Project Engineering Communication Data Analytics in Food Systems	Type C	1 A A 4 2 2
Year 3 Se Course Year 4 Se Course CH3104 CH3109 CH3111	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4  mester 1  Biochemical Engineering Decision Tools for Business & Engineering Process Control and Dynamics Unit Operations: Fluid-Fluid Separation	BDE BDE BDE BDE Type C C	AU 3 3 3 3 3 12 AU 3 3 3 3 3	Course CH3920  Year 4 Set Course CH4801 HW0288	Professional Internship  mester 2  Final Year Design Project Engineering Communication	Type C FC	10 10 Al 4 2 3
Year 3 Se Course Year 4 Se Course CH3104 CH3109 CH3111 CH3140 CH3802	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4  mester 1  Biochemical Engineering Decision Tools for Business & Engineering Process Control and Dynamics Unit Operations: Fluid-Fluid Separation Chemical & Biomolecular Engineering Laboratory 5	BDE BDE BDE BDE BDE C C C	AU 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Year 4 Se Course CH4801 HW0288 CH5211	Professional Internship  mester 2  Final Year Design Project Engineering Communication Data Analytics in Food Systems Future Foods - Introduction to Advanced Meet	Type C FC BDE	A A A A A A A A A A A A A A A A A A A
Year 3 Se Course Year 4 Se Course CH3104 CH3109 CH3111 CH3140 CH3802	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4  mester 1  Biochemical Engineering Decision Tools for Business & Engineering Process Control and Dynamics Unit Operations: Fluid-Fluid Separation Chemical & Biomolecular Engineering Laboratory 5 Final Year Design Project	BDE BDE BDE BDE BDE C C C	AU 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Year 4 Se Course CH4801 HW0288 CH5211	Professional Internship  mester 2  Final Year Design Project Engineering Communication Data Analytics in Food Systems Future Foods - Introduction to Advanced Meet Alternative	Type C FC BDE MPE	Al 10 AA A A 2 3 3 3
Year 3 Se Course Year 4 Se Course CH3104 CH3109 CH3111 CH3140 CH3802 CH4801	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4  mester 1  Biochemical Engineering Decision Tools for Business & Engineering Process Control and Dynamics Unit Operations: Fluid-Fluid Separation Chemical & Biomolecular Engineering Laboratory 5	BDE BDE BDE BDE BDE C C C	AU 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Year 4 Se Course CH4801 HW0288 CH5211	Professional Internship  mester 2  Final Year Design Project Engineering Communication Data Analytics in Food Systems Future Foods - Introduction to Advanced Meet Alternative	Type C FC BDE MPE	10 AI 42 3 3 3 3
Year 3 Se	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4  mester 1  Biochemical Engineering Decision Tools for Business & Engineering Process Control and Dynamics Unit Operations: Fluid-Fluid Separation Chemical & Biomolecular Engineering Laboratory 5 Final Year Design Project Food Process Technologies and New Production	BDE BDE BDE BDE C C C C C C C C C C C C C C C C C C C	AU 3 3 3 3 3 3 3 3 3 3 3 4	Year 4 Se Course CH4801 HW0288 CH5211	Professional Internship  mester 2  Final Year Design Project Engineering Communication Data Analytics in Food Systems Future Foods - Introduction to Advanced Meet Alternative	Type C FC BDE MPE	23 All 10 All 4 22 33 33
Year 3 Se Course Year 4 Se Course CH3104 CH3109 CH3111 CH3140 CH3802 CH4801	FF WUR Elective 1 FF WUR Elective 2 FF WUR Elective 3 FF WUR Elective 4  mester 1  Biochemical Engineering Decision Tools for Business & Engineering Process Control and Dynamics Unit Operations: Fluid-Fluid Separation Chemical & Biomolecular Engineering Laboratory 5 Final Year Design Project Food Process Technologies and New Production	BDE BDE BDE BDE C C C C C C C C C C C C C C C C C C C	AU 3 3 3 3 3 3 3 3 3 3 4 3 3 4 3	Year 4 Se Course CH4801 HW0288 CH5211	Professional Internship  mester 2  Final Year Design Project Engineering Communication Data Analytics in Food Systems Future Foods - Introduction to Advanced Meet Alternative	Type C FC BDE MPE	AI 10 AI

<sup>\*</sup>Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU). ^Counted towards 2nd Major in FF requirement (total 6U)

B.Eng. (CI	hemical & Biomolecular Engineering) with 2nd M	lajor in Fu	ture Foods				
	l Study Plan for AY2024-2025 intake (CHFF) ITU Based)						
	ssional Internship						
rear 1 Sei	mester 1			Year 1 Se	mester 2		
Course		Туре	AU	Course		Туре	Α
B1102	Introduction to Chemical and Biomedical Engineering	С	1	CB1103	Organic Chemistry For Engineers	С	3
CB1131	Introduction to Biomolecular Engineering	С	3	CB1117	Engineering Mathematics	С	4
CH1801	Chemical & Biomolecular Engineering	С	1	CH1104	Materials & Energy Balance	С	3
	Laboratory 1A				Chemical & Biomolecular Engineering		
ИН1810	Math 1	С	3	CH1802	Laboratory 2	С	1
PH1011	Physics or	С	3	EG1001 CC0003	Engineers in Society Ethics & Civics in a Multi-Cultural World	C CC	2
PH1012	Physics A (* For students without 'A' Level Physics)		4	CC0005	Healthy Living & Wellbeing	CC	3
CC0001	Inquiry and Communication in the	СС	2				
CC0002	Interdisciplinary World  Navigating the Digital World	CC	2				
			*				
			15 16				18
rear 2 Sei	mester 1			Year 2 Se	mester 2		
Course		Туре	AU	Course	01 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Type	Α
CH2103	Fluid Systems	С	3	CH2112	Chemical Reaction Engineering Heat & Mass Transfer in Chemical and	С	3
CH2107	Introduction to Computational Thinking	С	3	CH2114	Biological Systems	С	3
CH2108 CH2010	Thermodynamics	C C	3 3	CH2123 CH2151	Chemical Thermodynamics Unit Operations: Fluid-Solid Seperation	C C	3
	Engineering Statistics Chemical & Biomolecular Engineering	С			Chemical & Biomolecular Engineering	С	2
CH2801	Laboratory 2A		2	CH2802	Laboratory 2B		
CC0006	Sustainability: Society, Economy & Environment	CC	3	CC0007	Science & Technology for Humanity	CC	3
ML0004	Career and Entrepreneurial Development for the Future World	CC	2	CB0494	Introduction to Data Science and Artificial Intelligence	FC	3
CM5101	Food Chemistry & Nutrition	BDE	3	CH5220^	Food Standard - Food Safety and Risk Assessment	MPE	3
			22				2:
							_
rear 3 Sei	mester 1			Year 3 Se	mester 2		
CH3104	Biochemical Engineering	Type C	<b>AU</b> 3	Course CH3920	Professional Internship	Type FC	<b>A</b>
CH3109	Decision Tools for Business & Engineering	C	3	CH3920	Floressional internship	FC	- 1
CH3111	Process Control and Dynamics	С	3				
CH3121	Chemical, Biological & Plant Safety	С	2				
CH3140	Unit Operations: Fluid-Fluid Separation	С	3				
CH3802	Chemical & Biomolecular Engineering Laboratory 5	С	3				
HW0288	Engineering Communication	FC	2				
			19				1
'ear 4 Sei Course	mester 1	Туре	AU	Year 4 Se Course	mester 2	Туре	Α
H4801	Final Year Design Project	С	4	CH4801	Final Year Design Project	С	
CH5210	Food Process Technologies and New Production	BDE	3	CH5211	Data Analytics in Food Systems	BDE	3
	System  EE NTU Floative 1			CH5222^	Future Foods - Introduction to Advanced Meet	MPE	
	FF NTU Elective 1	BDE	3	CH5222"	Alternative		3
	FF NTU Elective 2	BDE	3		FF NTU Elective 4	BDE	3
	FF NTU Elective 3	BDE	3		FF NTU Elective 5	BDE	3
			16		Total (AU)		1
					LOTAL (ALI)		13

<sup>\*</sup>Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU). ^Counted towards 2nd Major in FST requirement (total 6U)