BSc in Chemistry and Biological Chemistry with 2nd Major in Food Science and Technology (CHFS)

AY2023 - 2024 Intake onwards

with Professional Internship

		Number of Academic Units (AU)							
Programme	Year of Study	Major Re	quirement	Interdis	ciplinary	Broadening and			
3	,	Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)	Deepening Electives (BDE)	Total		
	1	17/18*		11		6	34/35*		
Chemistry and	2	21		6	3	8	38		
Biological	3	18			2	19	39		
Chemistry	4		12		10	6	28		
	Total	56/57*	12	17	15	39	139/140*		

BSc in Chemistry and Biological Chemistry with 2nd Major in Food Science and Technology (FST)

Category			AU	Total AU
		ore (University-level)		
	CC0001 Inqu	uiry and Communication in the Interdisciplinary World	2	
	CC0002 Nav	igating the Digital World	2	
	CC0003 Ethi	cs & Civics in a Multi-Cultural World	2	
	CC0005 Hea	Ithy Living & Wellbeing	3	17
nterdisciplinary	CC0006 Sust	tainability: Society, Economy & Environment	3	
Collaborative	CC0007 Scie	nce & Technology for Humanity	3	
Core (ICC)	ML0004 Car	eer and Entrepreneurial Development for the Future World	2	
	Foundationa	al Core (College-level)		
		mmunication Across the Sciences	2	
		oduction to Data Science and Artificial Intelligence	3	15
		ofessional Internship	10	
	•	·	•	•
	CHEM Core		•	
	CM1001	Foundations of Chemistry I	4	
	CM1002	Foundations of Chemistry II	4	
	MH1802	Calculus for the Sciences	4	
	CM1804	Mathematics for Chemistry	2	
	PH1011	Physics <u>or</u> PH1012* Physics A	3/4*	
	CM2021	Inorganic and Bioinorganic Chemistry	3	
	CM2011	Analytical Chemistry	3	
	CM2061	Chemistry & Biological Chemistry Laboratory 1	3	
	PS0001	Introduction to Computational Thinking	3	56/57*
Major	CM2031	Organic and Bioorganic Chemistry	3	30/37
Requirement	CM2041	Physical and Biophysical Chemistry 1	3	
	CM2062	Chemistry & Biological Chemistry Laboratory 2	3	
	CM3011 ^{&}	Chemical Spectroscopy and Applications	3	
	CM3041 ^{&}	Physical and Biophysical Chemistry 2	3	
	CM3062	Chemistry & Biological Chemistry Laboratory 4	3	
	CM3031 ^{&}	Organic Reaction Mechanisms and Synthesis	3	
	CM3021 ^{&}	Organometallic Chemistry	3	
	CM3061	Chemistry & Biological Chemistry Laboratory 3	3	
	CHEM Maio	r Prescribed Electives (MPE)		
	4 x MPEs		12	12

	Food Science and Technology Compulsory Courses		
2nd Major in	1) CH5201 Food Chemistry	5	
2nd Major in Food Science	2) CH5200 Food Microbiology	3	
and Technology (FST)	3) CH5203 Food Process Engineering	5	20
	4) CH5202 Food Physics	3	30
(FS1)	5) CH5204 Quality Systems Operations	2	
	6) NTU-FST MPE x 4	12	
205	L. 2005	 	0
BDE	Any 3 BDE	9	9
Total			139/140*

^{*}Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).

[&]amp; CM3011, CM3021. CM3031, CM3041 are offered in both semesters.

	mistry and Biological Chemistry with 2nd	ı ıvıajor ı	n rood Scie	nce and recino	logy (CHFS)		
	Study Plan for AY2023-2024 intake sional Internship						
ear 1 Sem	nester 1			Year 1 Sen	Year 1 Semester 2		
Course		Туре	AU	Course		Туре	AU
CM1001	Foundations of Chemistry I	С	4	CM1002	Foundations of Chemistry II	С	4
MH1802	Calculus for the Sciences	С	4	CM1804	Mathematics for Chemistry	С	2
CC0001	Inquiry and Communication in the Interdisciplinary World	СС	2	PH1011/	Physics <u>or</u>	С	3
CC0002	Navigating the Digital World	СС	2	PH1012*	Physics A (For students without 'A' Level Physics)	С	4
CC0005	Healthy Living & Well-being	СС	3	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
				ML0004	Career and Entrepreneurial Development for the Future World	СС	2
HW0001	Introduction to Academic Communicati	ion #			BDE 1	BDE	3
					BDE 2	BDE	3
for studer	its who have not cleared QET		15				19/20
rear 2 Sem				Year 2 Sen	nester 2		
Course		Туре	AU	Course	=	Туре	AU
	Analytical and Bioanalytical						
CM2011	Chemistry	С	3	CM2031	Organic and Bioorganic Chemistry	С	3
CM2021	Inorganic and Bioinorganic Chemistry	С	3	CM2041	Physical and Biophysical Chemistry 1	С	3
CM2061	Chemistry & Biological Chemistry Laboratory 1	С	3	CM2062	Chemistry & Biological Chemistry Laboratory 2	С	3
PS0001	Introduction to Computational Thinking	С	3	PS0002	Introduction to Data Science and Artificial Intelligence	FC	3
CC0006	Sustainability: Society, Economy &	CC	3	CC0007	Science & Technology for Humanity	CC	3
	Environment						
CH5201	Food Chemistry	BDE	5	CH5200	Food Microbiology	BDE	3
			20				18
Year 3 Sem	nester 1			Year 3 Sen	nester 2		
Course		Туре	AU	Course		Туре	AU
CM3xxx ^{&}	CHEM-Core	С	3	CM3xxx ^{&}	CHEM-Core	С	3
CM3xxx ^{&}	CHEM-Core	С	3	CM3xxx ^{&}	CHEM-Core	С	3
CM3062	Chemistry & Biological Chemistry Laboratory 4	С	3	CM3061	Chemistry & Biological Chemistry Laboratory 3	С	3
CH5203	Food Process Engineering	BDE	5	CH5202	Food Physics	BDE	3
	NTU-FST Prescribed Elective	BDE	3	CH5204	Quality Systems Operations	BDE	2
	BDE 3	BDE	3	HW0218	NTU-FST Prescribed Elective Communication Across the Sciences	BDE FC	3 2
			20				19
Year 4 Sem	octor 1			Year 4 Sen	acetor 2		
rear 4 Sen Course	icater 1	Туре	AU	Course	incorci E	Туре	AU
CM4081	Professional Internship	FC	10	Course	CHEM MPE1	MPE	3
	. To to solo in a meet is inp		10		CHEM MPE2	MPE	3
					CHEM MPE3	MPE	3
					CHEM MPE4	MPE	3
					NTU-FST Prescribed Elective	BDE	3
					NTU-FST Prescribed Elective	BDE	3
			10				18
			10		Total (AU)		139/14
					iotal (AU)		199/14

This study plan is meant as a guide.

^{*}Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).

 $^{^{\}it 8}$ CM3xxx refers to CM3011, CM3021, CM3031, CM3041 - These courses are offered in both semesters

BSc in Chemistry and Biological Chemistry with 2nd Major in Food Science and Technology (CHFS)

AY2023 - 2024 Intake onwards

FYP with Professional Attachment

		Number of Academic Units (AU)							
Programme	Year of	Major Requirement		Interdisc	ciplinary	Broadening and			
	Study	Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)	Deepening Electives (BDE)	Total		
	1	17/18*		11			28/29*		
Chemistry and	2	21		6	3	8	38		
Biological	3	18			7	18	43		
Chemistry	4		22			8	30		
	Total	56/57*	22	17	10	34	139/140*		

Category		AU	Total AU
<u> </u>	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
nterdisciplinary	CC0006 Sustainability: Society, Economy & Environment	3	
Collaborative	CC0007 Science & Technology for Humanity	3	
Core (ICC)	ML0004 Career and Entrepreneurial Development for the Future World	2	
	Foundational Core (College-level)		
	HW0218 Communication Across the Sciences	2	
	PS0002 Introduction to Data Science and Artificial Intelligence	3	10
	CM4082 Professional Attachment	5	
	CHEM Core		
	CM1001 Foundations of Chemistry I	4	
	CM1002 Foundations of Chemistry II	4	
	MH1802 Calculus for the Sciences	4	
	CM1804 Mathematics for Chemistry	2	
	PH1011 Physics or PH1012* Physics A	3/4*	
	CM2021 Inorganic and Bioinorganic Chemistry	3	
	CM2011 Analytical Chemistry	3	
	CM2061 Chemistry & Biological Chemistry Laboratory 1	3	
	PS0001 Introduction to Computational Thinking	3	56/57*
Major	CM2031 Organic and Bioorganic Chemistry	3	30/37
Major	CM2041 Physical and Biophysical Chemistry 1	3	
Requirement	CM2062 Chemistry & Biological Chemistry Laboratory 2	3	
	CM3011 ^{&} Chemical Spectroscopy and Applications	3	
	CM3041 ^{&} Physical and Biophysical Chemistry 2	3	
	CM3062 Chemistry & Biological Chemistry Laboratory 4	3	
	CM3031 ^{&} Organic Reaction Mechanisms and Synthesis	3	
	CM3021 ^{&} Organometallic Chemistry	3	
	CM3061 Chemistry & Biological Chemistry Laboratory 3	3	
	CHEM Major Prescribed Electives (MPE)	4.2	
	CM4080 Honours Project 1	10	22
	4 x MPEs	12	

Total			139/140*
BDE	Any 2 BDE	4	4
	6) NTU-FST MPE x 4	12	
(FST)	5) CH5204 Quality Systems Operations	2	
Food Science and Technology	3) CH5203 Food Process Engineering 4) CH5202 Food Physics	3	30
	2) CH5200 Food Microbiology	3	
2nd Major in	1) CH5201 Food Chemistry	5	
	Food Science and Technology Compulsory Courses		

^{*}Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).

 $^{^{\&}amp;}$ CM3011, CM3021. CM3031, CM3041 are offered in both semesters.

	rofessional Attachment Option						
Year 1 Sen	nester 1			Year 1 Sen	nester 2		
Course		Туре	AU	Course		Type	AU
CM1001	Foundations of Chemistry I	С	4	CM1002	Foundations of Chemistry II	С	4
ИН1802	Calculus for the Sciences	С	4	CM1804	Mathematics for Chemistry	С	2
CC0001	Inquiry and Communication in the	CC	2	PH1011/	Physics or	С	3
CC0002	Navigating the Digital World	СС	2	PH1012*	Physics A (For students without 'A'	С	4
20002	Navigating the Digital World	CC	2	F111012	Level Physics)	C	4
CC0005	Healthy Living & Well-being	CC	3	CC0003	Ethics & Civics in a Multi-Cultural	CC	2
					World Career and Entrepreneurial		
		,,		ML0004	Development for the Future World	CC	2
HW0001	Introduction to Academic Communicat	ion"					
for stude	nts who have not cleared QET		15				13/1
ear 2 Sen				Year 2 Sen	norter 3		
	nestel 1	Туре	Λ11		nestel 2	Typo	A11
Course	Analytical and Bioanalytical	туре	AU	Course		Туре	AU
CM2011	Chemistry	С	3	CM2031	Organic and Bioorganic Chemistry	С	3
CM2021	Inorganic and Bioinorganic Chemistry	С	3	CM2041	Physical and Biophysical Chemistry 1	С	3
CM2061	Chemistry & Biological Chemistry Laboratory 1	С	3	CM2062	Chemistry & Biological Chemistry Laboratory 2	С	3
PS0001	Introduction to Computational Thinking	С	3	PS0002	Introduction to Data Science and Artificial Intelligence	FC	3
CC0006	Sustainability: Society, Economy &	CC	3	CC0007	Science & Technology for Humanity	CC	3
CH5201	Environment Food Chemistry	BDE	5	CH5200	Food Microbiology	BDE	3
			20				18
Year 3 Sen Course	nester 1	Туре	AU	Year 3 Sen Course	nester 2	Туре	AU
CM3xxx ^{&}	CHEM-Core	C	3	CM3xxx ^{&}	CHEM-Core	С	3
CM3xxx ^{&}	CHEM-Core	_	3	CIVISXXX	CHEM-Core	_	_
LIVI3XXX		C	3	CM3xxx ^{&}		C	3
CM3062	Chemistry & Biological Chemistry Laboratory 4	С	3	CM3061	Chemistry & Biological Chemistry Laboratory 3	С	3
CH5203	Food Process Engineering	BDE	5	CH5202	Food Physics	BDE	3
	NTU-FST Prescribed Elective	BDE	3	CH5204	Quality Systems Operations	BDE	2
	BDE 1	BDE	2		NTU-FST Prescribed Elective	BDE	3
				HW0218	Communication Across the Sciences	FC	2
				Year 3 Spe	cial Sem		
				CN 4 4 0 0 2	Professional Attachment	FC	5
				CM4082			
			19				24
loor A Sec	noctor 1		19		noctor 2		24
	nester 1	Type		Year 4 Sen	nester 2	Type	
		Type MPE	AU			Type MPE	AU
	CHEM MPE1	Type MPE MPE	AU 3	Year 4 Sen Course	Honours Project 1	MPE	
		MPE	AU	Year 4 Sen Course			AU 10
	CHEM MPE1 CHEM MPE2	MPE MPE	AU 3 3	Year 4 Sen Course	Honours Project 1	MPE	AU 10
	CHEM MPE1 CHEM MPE2 CHEM MPE3	MPE MPE MPE	AU 3 3 3	Year 4 Sen Course	Honours Project 1	MPE	AU 10
	CHEM MPE1 CHEM MPE2 CHEM MPE3 CHEM MPE4	MPE MPE MPE MPE	AU 3 3 3 3 3	Year 4 Sen Course	Honours Project 1	MPE	AU 10
	CHEM MPE1 CHEM MPE2 CHEM MPE3 CHEM MPE4 NTU-FST Prescribed Elective	MPE MPE MPE MPE BDE	AU 3 3 3 3 3 3 3 3	Year 4 Sen Course	Honours Project 1	MPE	10 2
Year 4 Sen Course	CHEM MPE1 CHEM MPE2 CHEM MPE3 CHEM MPE4 NTU-FST Prescribed Elective	MPE MPE MPE MPE BDE	AU 3 3 3 3 3 3 3	Year 4 Sen Course	Honours Project 1	MPE	AU 10

This study plan is meant as a guide.

^{*}Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).

 $^{^{\&}amp;}$ CM3xxx refers to CM3011, CM3021, CM3031, CM3041 - These courses are offered in both semesters

BSc in Chemistry and Biological Chemistry with 2nd Major in Food Science and Technology (CHFS)

AY2023 - 2024 Intake onwards

with Professional Internship and FYP

	_	Number of Academic Units (AU)							
Programme	Year of	Major Re	quirement	Interdisc	ciplinary	Broadening and			
	Study	Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)	Deepening Electives (BDE)	Total		
	1	20/21*		11			31/32*		
Chemistry and	2	18		6	3	14	41		
Biological	3	18	6		2	16	42		
Chemistry	4		16		10		26		
	Total	56/57*	22	17	15	30	140/141*		

	Total	56/5/*	22	1/	15	30	140/141*
BSc in Chemistry	and Biolo	gical Chemistry	with 2nd Majo	r in Food Scienc	e and Technolo	gy (FST)	
Category						AU	Total AU
	Common	Core (University	-level)				
	CC0001 In	quiry and Comm	nunication in th	e Interdisciplina	ry World	2	
	CC0002 N	avigating the Dig	gital World			2	
	CC0003 Et	hics & Civics in a	a Multi-Cultural	l World		2	
	CC0005 H	ealthy Living & V	Vellbeing			3	17
Interdisciplinary	CC0006 St	ustainability: Soc	ciety, Economy	& Environment		3	
Collaborative	CC0007 Sc	ience & Techno	logy for Humar	nity		3	
Core (ICC)	ML0004 C	areer and Entre	preneurial Deve	elopment for the	e Future World	2	
	Foundatio	nal Core (Colleg	ge-level)				
	HW0218 (Communication .	Across the Scie	nces		2	
	PS0002 In	troduction to Da	nta Science and	Artificial Intellig	gence	3	15
	CM4081 P	rofessional Inte	10				
	T						
	CHEM Cor		_	<u> </u>			
	CM1001	Foundations of	•			4	
	CM1002	Foundations of	· · · · · · · · · · · · · · · · · · ·			4	
	MH1802	Calculus for the				4	
	CM1804	Mathematics for	· · · · · · · · · · · · · · · · · · ·			2	
	PH1011	Physics or PH10		omistr.		3/4*	
	CM2021	Inorganic and E	-	emistry		3	
	CM2011	Analytical Cher			•	3	
	CM2061	=	_	stry Laboratory 1	L	3	
	PS0001	Introduction to	=	_		3	56/57*
Major	CM2031	Organic and Bio	_	=		3	
Requirement	CM2041	Physical and Bi	• •	-	,	3	
	CM2062			stry Laboratory 2	2	3	
		Chemical Spect				3	
		Physical and Bi			1	3	
	CM3062		_	stry Laboratory 4	+	3	
		Organic Reaction Organometallic		and Synthesis		3	
	CM3021 CM3061			stry Laboratory 3)	3 3	
	CIVISUBT	Chemistry & Bi	ological Chemis	stry Laboratory 3)	3	
	CHEM Ma	jor Prescribed E	lectives (MPE)				
	CM4080	Honours Projec	it 1			10	22
	4 x MPEs					12	

	Food Science and Technology Compulsory Courses		
2nd Maior in	1) CH5201 Food Chemistry	5	
Food Science	2) CH5200 Food Microbiology	3	
and Technology	3) CH5203 Food Process Engineering	5	30
(FST)	4) CH5202 F000 Physics	3	
(1.2.7)	5) CH5204 Quality Systems Operations	2	
	6) NTU-FST MPE x 4	12	
Total			140/141*

^{*}Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).

[&] CM3011, CM3021. CM3031, CM3041 are offered in both semesters.

Suggested S	nistry and Biological Chemistry with 2nd Study Plan for AY2023-2024 intake sional Internship and FYP	Major ir	rood Scier	nce and Technol	ogy (CHFS)		
Year 1 Sem				Year 1 Sen	nester 2		
Course	Farm dations of Chambiature	Туре	AU	Course	Farm dations of Chambiatan II	Type	AU
CM1001 MH1802	Foundations of Chemistry I	C C	4	CM1002	Foundations of Chemistry II	С	4 2
IVIT1802	Calculus for the Sciences Inquiry and Communication in the	C	4	CM1804	Mathematics for Chemistry	С	2
CC0001	Interdisciplinary World	CC	2	PH1011/	Physics or	С	3
CC0002	Navigating the Digital World	CC	2	PH1012*	Physics A (For students without 'A' Level Physics)	С	4
CC0005	Healthy Living & Well-being	CC	3	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
HW0001	Introduction to Academic Communication	on*		ML0004	Career and Entrepreneurial Development for the Future World	CC	2
			45				12/14*
# for studen	ts who have not cleared QET		15				13/14*
Year 2 Sem	ester 1			Year 2 Sen	nester 2		
Course	ester 1	Туре	AU	Course	nester 2	Туре	AU
Course			AU	Course		туре	AU
CM2011	Analytical and Bioanalytical Chemistry	С	3	CM2031	Organic and Bioorganic Chemistry	С	3
CM2021	Inorganic and Bioinorganic Chemistry	С	3	CM2041	Physical and Biophysical Chemistry 1	С	3
CM2061	Chemistry & Biological Chemistry Laboratory 1	С	3	CM2062	Chemistry & Biological Chemistry Laboratory 2	С	3
PS0001	Introduction to Computational Thinking	С	3	PS0002	Introduction to Data Science and Artificial Intelligence	FC	3
CC0006	Sustainability: Society, Economy & Environment	CC	3	CC0007	Science & Technology for Humanity	CC	3
CH5201	Food Chemistry	BDE	5	CH5200	Food Microbiology	BDE	3
					NTU-FST Prescribed Elective	BDE	3
			20				21
Year 3 Sem	ester 1			Year 3 Sen	nester 2		
Course	0.1514.0	Туре	AU	Course	0.1514.0	Туре	AU
CM3xxx ^{&}	CHEM-Core	С	3	CM3xxx ^{&}	CHEM-Core	С	3
CM3xxx ^{&}	CHEM-Core	С	3	CM3061	Chemistry & Biological Chemistry Laboratory 3	С	3
CM3xxx ^{&}	CHEM-Core	С	3	CH5202	Food Physics	BDE	3
CM3062	Chemistry & Biological Chemistry Laboratory 4	С	3	CH5204	Quality Systems Operations	BDE	2
CH5203	Food Process Engineering	BDE	5	HW0218	Communication Across the Sciences	FC	2
	NTU-FST Prescribed Elective	BDE	3		NTU-FST Prescribed Elective	BDE	3
	NTO-131 Prescribed Elective	DDL	3		NTU-FST Prescribed Elective	BDE	3
					CHEM MPE 1	MPE	3
			20				22
Year 4 Sem	ester 1	_		Year 4 Sen	nester 2	_	
Course	2.6	Туре	AU	Course		Туре	AU
CM4081	Professional Internship	FC	10	CM4080	Honours Project 1	MPE	10
					CHEM MPE 2	MPE MPE	3 3
					CHEM MPE 3 CHEM MPE 4	MPE	3 3
					CHEIVI IVII E 4	IVIFE	3
			10				19
					Total (AU)		140/141*
This is a	olan is meant as a auide.						

This study plan is meant as a guide.
*Students without 'A' Level Physics will take 'PH1012 Physics A' (4AU).

[&]amp; CM3xxx refers to CM3011, CM3021, CM3031, CM3041 - These courses are offered in both semesters