

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

AY2023 Intake

FYP with Professional Attachment

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

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

Category		AU	Total AU
Interdisciplinary Collaborative Core (ICC)	Common Core (University-level)		
	CC0001 Inquiry and Communication in the Interdisciplinary World	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	
	ML0004 Career and Entrepreneurial Development for the Future World	2	
	Foundational Core (College-level)		
	HW0218 Communication Across the Sciences	2	10
	PS0002 Introduction to Data Science and Artificial Intelligence	3	
	CM4082 Professional Attachment	5	

Major Requirement	CHEM Core		
	CM1001 Foundations of Chemistry I	4	56/57*
	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	
	CM2031 Organic and Bioorganic Chemistry	3	
	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 Major Prescribed Electives (MPE)		
	CM4080 Honours Project 1	10	22
	4 x MPEs	12	

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

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

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

BSc in Chemistry and Biological Chemistry with 2nd Major in Food Science and Technology (CHFS)							
Suggested Study Plan for AY2023 intake							
FYP with Professional Attachment Option							
Year 1 Semester 1				Year 1 Semester 2			
Course		Type	AU	Course		Type	AU
CM1001	Foundations of Chemistry I	C	4	CM1002	Foundations of Chemistry II	C	4
MH1802	Calculus for the Sciences	C	4	CM1804	Mathematics for Chemistry	C	2
CC0001	Inquiry and Communication in the	CC	2	PH1011/	Physics <u>or</u>	C	3
CC0002	Navigating the Digital World	CC	2	PH1012*	Physics A <i>(For students without 'A' Level Physics)</i>	C	4
CC0005	Healthy Living & Well-being	CC	3	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
				ML0004	Career and Entrepreneurial Development for the Future World	CC	2
HW0001	Introduction to Academic Communication [#]						
			15	13/14*			
[#] for students who have not cleared QET							
Year 2 Semester 1				Year 2 Semester 2			
Course		Type	AU	Course		Type	AU
CM2011	Analytical and Bioanalytical Chemistry	C	3	CM2031	Organic and Bioorganic Chemistry	C	3
CM2021	Inorganic and Bioinorganic Chemistry	C	3	CM2041	Physical and Biophysical Chemistry 1	C	3
CM2061	Chemistry & Biological Chemistry Laboratory 1	C	3	CM2062	Chemistry & Biological Chemistry Laboratory 2	C	3
PS0001	Introduction to Computational Thinking	C	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
			20	18			
Year 3 Semester 1				Year 3 Semester 2			
Course		Type	AU	Course		Type	AU
CM3xxx ^{&}	CHEM-Core	C	3	CM3xxx ^{&}	CHEM-Core	C	3
CM3xxx ^{&}	CHEM-Core	C	3	CM3xxx ^{&}	CHEM-Core	C	3
CM3062	Chemistry & Biological Chemistry Laboratory 4	C	3	CM3061	Chemistry & Biological Chemistry Laboratory 3	C	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
			19	24			
<u>Year 3 Special Sem</u>							
				CM4082	Professional Attachment	FC	5
			19	24			
Year 4 Semester 1				Year 4 Semester 2			
Course		Type	AU	Course		Type	AU
	CHEM MPE1	MPE	3	CM4080	Honours Project 1	MPE	10
	CHEM MPE2	MPE	3		BDE 2	BDE	2
	CHEM MPE3	MPE	3				
	CHEM MPE4	MPE	3				
	NTU-FST Prescribed Elective	BDE	3				
	NTU-FST Prescribed Elective	BDE	3				
			18	12			
Total (AU)						139/140*	

This study plan is meant as a guide.

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

[&] 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 Intake with Professional Internship								
Programme	Year of Study	Number of Academic Units (AU)						
		Major Requirement		Interdisciplinary		Broadening and Deepening Electives (BDE)	Total	
		Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)			
Chemistry and Biological Chemistry	1	17/18*		11		6	34/35*	
	2	21		6	3	8	38	
	3	18			2	19	39	
	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	
Interdisciplinary Collaborative Core (ICC)	Common Core (University-level)							
	CC0001 Inquiry and Communication in the Interdisciplinary World					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		
	ML0004 Career and Entrepreneurial Development for the Future World					2		
	Foundational Core (College-level)							
	HW0218 Communication Across the Sciences					2	15	
PS0002 Introduction to Data Science and Artificial Intelligence					3			
CM4081 Professional Internship					10			
Major Requirement	CHEM Core							
	CM1001	Foundations of Chemistry I				4	56/57*	
	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		
	CM2031	Organic and Bioorganic Chemistry				3		
	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 Major Prescribed Electives (MPE)							
	4 x MPEs					12	12	

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

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

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

BSc in Chemistry and Biological Chemistry with 2nd Major in Food Science and Technology (CHFS)							
Suggested Study Plan for AY2023 intake							
with Professional Internship							
Year 1 Semester 1				Year 1 Semester 2			
Course		Type	AU	Course		Type	AU
CM1001	Foundations of Chemistry I	C	4	CM1002	Foundations of Chemistry II	C	4
MH1802	Calculus for the Sciences	C	4	CM1804	Mathematics for Chemistry	C	2
CC0001	Inquiry and Communication in the Interdisciplinary World	CC	2	PH1011/	Physics <u>or</u>	C	3
CC0002	Navigating the Digital World	CC	2	PH1012*	Physics A (<i>For students without 'A' Level Physics</i>)	C	4
CC0005	Healthy Living & Well-being	CC	3	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
				ML0004	Career and Entrepreneurial Development for the Future World	CC	2
HW0001	Introduction to Academic Communication [#]				BDE 1	BDE	3
					BDE 2	BDE	3
			15				19/20*
[#] for students who have not cleared QET							
Year 2 Semester 1				Year 2 Semester 2			
Course		Type	AU	Course		Type	AU
CM2011	Analytical and Bioanalytical Chemistry	C	3	CM2031	Organic and Bioorganic Chemistry	C	3
CM2021	Inorganic and Bioinorganic Chemistry	C	3	CM2041	Physical and Biophysical Chemistry 1	C	3
CM2061	Chemistry & Biological Chemistry Laboratory 1	C	3	CM2062	Chemistry & Biological Chemistry Laboratory 2	C	3
PS0001	Introduction to Computational Thinking	C	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
			20				18
Year 3 Semester 1				Year 3 Semester 2			
Course		Type	AU	Course		Type	AU
CM3xxx ^{&}	CHEM-Core	C	3	CM3xxx ^{&}	CHEM-Core	C	3
CM3xxx ^{&}	CHEM-Core	C	3	CM3xxx ^{&}	CHEM-Core	C	3
CM3062	Chemistry & Biological Chemistry Laboratory 4	C	3	CM3061	Chemistry & Biological Chemistry Laboratory 3	C	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		NTU-FST Prescribed Elective	BDE	3
				HW0218	Communication Across the Sciences	FC	2
			20				19
Year 4 Semester 1				Year 4 Semester 2			
Course		Type	AU	Course		Type	AU
CM4081	Professional Internship	FC	10		CHEM MPE1	MPE	3
					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
Total (AU)						139/140*	

This study plan is meant as a guide.

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

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

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		Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)		
Chemistry and Biological Chemistry	1	20/21*		11			31/32*
	2	18		6	3	14	41
	3	18	6		2	16	42
	4		16		10		26
	Total	56/57*	22	17	15	30	140/141*

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

Category	AU		Total AU
Interdisciplinary Collaborative Core (ICC)	Common Core (University-level)		17
	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	
	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
	HW0218 Communication Across the Sciences	2	
	PS0002 Introduction to Data Science and Artificial Intelligence	3	
	CM4081 Professional Internship	10	
Major Requirement	CHEM Core		56/57*
	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	
	CM2031 Organic and Bioorganic Chemistry	3	
	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 Major Prescribed Electives (MPE)		22
	CM4080 Honours Project 1	10	
	4 x MPEs	12	

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

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

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Suggested Study Plan for AY2023 intake									
with Professional Internship and FYP									
Year 1 Semester 1					Year 1 Semester 2				
Course		Type	AU		Course		Type	AU	
CM1001	Foundations of Chemistry I	C	4		CM1002	Foundations of Chemistry II	C	4	
MH1802	Calculus for the Sciences	C	4		CM1804	Mathematics for Chemistry	C	2	
CC0001	Inquiry and Communication in the Interdisciplinary World	CC	2		PH1011/	Physics <u>or</u>	C	3	
CC0002	Navigating the Digital World	CC	2		PH1012*	Physics A (<i>For students without 'A' Level Physics</i>)	C	4	
CC0005	Healthy Living & Well-being	CC	3		CC0003	Ethics & Civics in a Multi-Cultural World	CC	2	
					ML0004	Career and Entrepreneurial Development for the Future World	CC	2	
HW0001	Introduction to Academic Communication*								
			15					13/14*	
# for students who have not cleared QET									
Year 2 Semester 1					Year 2 Semester 2				
Course		Type	AU		Course		Type	AU	
CM2011	Analytical and Bioanalytical Chemistry	C	3		CM2031	Organic and Bioorganic Chemistry	C	3	
CM2021	Inorganic and Bioinorganic Chemistry	C	3		CM2041	Physical and Biophysical Chemistry 1	C	3	
CM2061	Chemistry & Biological Chemistry Laboratory 1	C	3		CM2062	Chemistry & Biological Chemistry Laboratory 2	C	3	
PS0001	Introduction to Computational Thinking	C	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 Semester 1					Year 3 Semester 2				
Course		Type	AU		Course		Type	AU	
CM3xxx ^{&}	CHEM-Core	C	3		CM3xxx ^{&}	CHEM-Core	C	3	
CM3xxx ^{&}	CHEM-Core	C	3		CM3061	Chemistry & Biological Chemistry Laboratory 3	C	3	
CM3xxx ^{&}	CHEM-Core	C	3		CH5202	Food Physics	BDE	3	
CM3062	Chemistry & Biological Chemistry Laboratory 4	C	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	
						NTU-FST Prescribed Elective	BDE	3	
						CHEM MPE 1	MPE	3	
			20					22	
Year 4 Semester 1					Year 4 Semester 2				
Course		Type	AU		Course		Type	AU	
CM4081	Professional Internship	FC	10		CM4080	Honours Project 1	MPE	10	
						CHEM MPE 2	MPE	3	
						CHEM MPE 3	MPE	3	
						CHEM MPE 4	MPE	3	
			10					19	
					Total (AU)			140/141*	

This study plan is meant as a guide.

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

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