BSc in Chemistry and Biological Chemistry with 2nd Major in Environmental Science (CHES)

AY2023 - 2024 Intake onwards

FYP with Professional Attachment

			ı	Number of Acad	lemic Units (AU	1)		
Programme	Year of	Major Red	quirement	Interdis	ciplinary	Broadening and		
	Study	Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)	Deepening Electives (BDE)	Total	
	1	17/18*		9		3	29/30*	
Chemistry and	2	21		8	3	6	38	
Biological	3	18			7	23/24#	48/49 [#]	
Chemistry	4		22			2	24	
	Total	56/57*	22	17	10	34/35#	139-141*#	

BSc in Chemistry and Biological Chemistry with 2nd Major in Environmental Science (CHES)

Category			AU	Total AU					
	Common (Core (University-level)							
	CC0001 In	quiry and Communication in the Interdisciplinary World	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					
nterdisciplinary	CC0006 Su	stainability: Society, Economy & Environment	·						
Collaborative	CC0007 Sc	3							
Core (ICC)	ML0004 Ca	areer and Entrepreneurial Development for the Future	2						
	Foundatio	nal Core (College-level)							
	HW0218 C	Communication Across the Sciences	2						
	PS0002 Int	roduction to Data Science and Artificial Intelligence	3	10					
	CM4082 P	rofessional Attachment	5						
	CHEM Cor								
		e Foundations of Chemistry I	4						
		·	4						
		•	4						
	CM1804	Mathematics for Chemistry	2						
	PH1011	Physics or PH1012* Physics A	3/4*						
		Inorganic and Bioinorganic Chemistry	3						
		Analytical Chemistry	3						
		Chemistry & Biological Chemistry Laboratory 1	3						
	PS0001	Introduction to Computational Thinking	3						
		Organic and Bioorganic Chemistry	3	57/50*					
Major		Physical and Biophysical Chemistry 1	3	57/58*					
Requirement	CM2062	Chemistry & Biological Chemistry Laboratory 2	3						
		Chemical Spectroscopy and Applications	3						
		Physical and Biophysical Chemistry 2	3						
		Chemistry & Biological Chemistry Laboratory 4	3						
		Organic Reaction Mechanisms and Synthesis	3						
		Organometallic Chemistry							
			3						
	CM3061	Chemistry & Biological Chemistry Laboratory 3	3						
	CHEM Ma	ior Prescribed Electives (MPE)	<u> </u>						
	CM4080	Honours Project 1	10	22					
	4 x MPEs		12						

	Environmental Science Compulsory Courses		
	1) ES1007 Climate Change or ES5007 Climate and Climate Change	3	
	2) ES3003 Introduction to Geochemistry	3	
	3) ES3802 The Urban Environment: Issue, Assessment, and	3	
	4) ES5001 Natural Hazards and Society	3	
	5) ES5006 Environmental Sustainability	3	
	Choose 5 Courses from the following list		
2nd Major in	1) ES2003 [#] E2S2 Biosphere	4	
Environmental	2) ES3801 Biogeochemistry	3	
Science (CHES)	3) ES5002 Emergent Life	3	30/31#
science (CHLS)	4) ES5003 Blue Planet: How the Oceans Work	3	
	5) ES5005 Environmental Earth Systems Science	3	
	6) ES3203 (ES9003) The Genome and Society	3	
	7) EM5101 Environmental Quality	3	
	8) EM5103 Water Resource Management	3	
	9) EM5104 Air Quality Management	3	
	10) EM5105 Energy Resources Management	3	
	11) EM 5107 Environmental Health and Safety Management	3	
	12) EM5109 Environmental Issues and Sustainability	3	
	Students are responsible to plan for their 2nd major courses		
DE	Any 2 BDE	4	4
otal			139-141*#

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

^{*} Students taking ES2003 E2S2 Biophere will clock 31 AU.

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

	Study Plan for AY2023-2024 intake rofessional Attachment Option						
				Vacu 1 Sam	acatau 3		
Year 1 Sem Course	ester 1	Туре	AU	Year 1 Sem Course	iester 2	Туре	AU
CM1001	Foundations of Chemistry I	С	4	CM1002	Foundations of Chemistry II	С	4
MH1802	Calculus for the Sciences	C	4	CM1804	Mathematics for Chemistry	C	2
	Inquiry and Communication in an				·		
CC0001	interdisciplinary World	CC	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 & Wellbeing	CC	3	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
HW0001	Introduction to Academic Communicati	ion #		ES1007	Climate Change	BDE	3
			45				44/45
for studen	its who have not cleared QET		15				14/15
Year 2 Sem	ester 1			Year 2 Sem	nester 2		
Course		Туре	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	СС	3	ML0004	Career and Entrepreneurial Development for the Future World	СС	2
CC0007	Science & Technology for Humanity	CC	3	ES3802	The Urban Environment: Issue, Assessment and Management	BDE	3
ES5001	Natural Hazards and Society	BDE	3		G		
			21				17
Year 3 Sem	ester 1			Year 3 Sem	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	С	3	CM3061	Chemistry & Biological Chemistry	С	3
	Laboratory 4				Laboratory 3		
ES3003	Introduction to Geochemistry	BDE	3	ES5006	Environmental Sustainability	BDE	3
	CHES Elective 1	BDE	3		CHES Elective 4	BDE	3/4#
	CHES Elective 2	BDE	3		CHES Elective 5	BDE	3
	CHES Elective 3	BDE	3	HW0218	Communication Across the Sciences	FC	2
	BDE 1	BDE	2				
				<u>Year 3 Spe</u> CM4082	<u>cial Sem</u> Professional Attachment	FC	5
			22	-			25/2-
			23				25/26
Year 4 Sem	ester 1	Tuno	A11	Year 4 Sem	nester 2	Tuna	A11
Course	CHEM MPE1	Type MPE	AU 3	Course CM4080	Honours Project 1	Type MPE	AU 10
	CHEM MPE2	MPE	3	CIVI4U8U	BDE 2	BDE	2
	CHEM MPE3	MPE	3		DUL Z	DDE	2
	CHEM MPE4	MPE	3				
	CITEIVI IVIF L4	IVIFC	3				
			12				12

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 #ES2003 E2S2 Biophere 4AU

BSc in Chemistry and Biological Chemistry with 2nd Major in Environmental Science (CHES)

AY2023 - 2024 Intake onwards

with Professional Internship

D	Year of	Maior Re	equirement	Number of Acad	lemic Units (AU ciplinary) Broadening and	
Programme	Study	Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core	Deepening Electives (BDE)	Total
	1	17/18*		9		3	29/30*
Chemistry and	2	21		8	3	6	38
Biological	3	18			2	24/25#	44/45#
Chemistry	4		12		10	6	28
	Total	56/57*	12	17	15	39/40 [#]	139-141*#

BSc in Chemistry and Biological Chemistry with 2nd Major in Environmental Science (CHES)

Category		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			
· · · · · · · · · · · · · · · · · · ·	CC0006 Sustainability: Society, Economy & Environment	3	1,			
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	15			
	CM4081 Professional Internship	10				
	[au-a-a		1			
	CHEM Core CM1001 Foundations of Chemistry I	4				
	CM1001 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				
Major	CM2031 Organic and Bioorganic Chemistry	3	56/57*			
Requirement	CM2041 Physical and Biophysical Chemistry 1	3	30/37			
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 x MPEs	12	12			

	Environmental Science Compulsory Courses		
	1) ES1007 Climate Change or ES5007 Climate and Climate Change	3	
	2) ES3003 Introduction to Geochemistry	3	
	3) ES3802 The Urban Environment: Issue, Assessment, and	3	
	4) ES5001 Natural Hazards and Society	3	
	5) ES5006 Environmental Sustainability	3	
	Choose 5 Courses from the following list		
2 mal Majanja	1) ES2003 [#] E2S2 Biosphere	4	
2nd Major in Environmental	2) ES3801 Biogeochemistry	3	
	3) ES5002 Emergent Life	3	30/31#
Science (CHES)	4) ES5003 Blue Planet: How the Oceans Work	3	
	5) ES5005 Environmental Earth Systems Science	3	
	6) ES3203 (ES9003) The Genome and Society	3	
	7) EM5101 Environmental Quality	3	
	8) EM5103 Water Resource Management	3	
	9) EM5104 Air Quality Management	3	
	10) EM5105 Energy Resources Management	3	
	11) EM 5107 Environmental Health and Safety Management	3	
	12) EM5109 Environmental Issues and Sustainability	3	
	Students are responsible to plan for their 2nd major courses		
BDE	Any 3 BDE	9	9
Total			139-141*#

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

^{*}Students taking ES2003 E2S2 Biophere will clock 31 AU.

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

BSc in Cher	mistry and Biological Chemistry with 2nd	d Major i	n Environm	ental Science (CI	HES)		
Suggested	Study Plan for AY2023-2024 intake						
with Profes	ssional Internship						
Year 1 Sem	agetor 1			Year 1 Sem	nactor 7		
Course	iestei 1	Туре	AU	Course	iestei 2	Туре	AU
CM1001	Foundations of Chemistry I	С	4	CM1002	Foundations of Chemistry II	С	4
MH1802	Calculus for the Sciences	C	4	CM1804	Mathematics for Chemistry	C	2
CC0001	Inquiry and Communication in an 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 & Wellbeing	СС	3	CC0003	Ethics & Civics in a Multi-Cultural World	СС	2
I				ES1007	Climate Change	BDE	3
HW0001	Introduction to Academic Communicati	ion [#]					
			15				14/15*
[#] for studen	nts who have not cleared QET						
Year 2 Sem	anctor 1			Year 2 Sem	anctor 7		
Course	iester 1	Туре	AU	Course	lester 2	Туре	AU
	Analytical and Bioanalytical				- 121 12Chantala		
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 & Environment	СС	3	ML0004	Career and Entrepreneurial Development for the Future World	CC	2
CC0007	Science & Technology for Humanity	СС	3	ES3802	The Urban Environment: Issue, Assessment and Management	BDE	3
ES5001	Natural Hazards and Society	BDE	3				
	_		21				17
Year 3 Sem	nester 1			Year 3 Sem	nester 2		
Course		Туре	AU	Course	<u></u>	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	С	3	CM3061	Chemistry & Biological Chemistry	С	3
	Laboratory 4				Laboratory 3		
ES3003	Introduction to Geochemistry	BDE	3	ES5006	Environmental Sustainability	BDE	3
	CHES Elective 1	BDE	3		CHES Elective 4	BDE	3/4#
l	CHES Elective 2	BDE	3		CHES Elective 5	BDE	3
l	CHES Elective 3	BDE	3	HW0218	Communication Across the Sciences	FC	2
	BDE 1	BDE	3				
			24				20/21#
	_				-		
Year 4 Sem Course	iester 1	Tyne	All	Year 4 Sem	nester 2	Type	ΛII
CM4081	Professional Internship	Type FC	10	Course	CHEM MPE1	Type MPE	AU 3
CIVI4UOI	Professional internship	FC	10		CHEM MPE2	MPE	3
					CHEM MPE3	MPE	3
					CHEM MPE4	MPE	3
					BDE 2	BDE	3
					BDE 2 BDE 3	BDE	3
					BBE 3	002	3
1							
			10		Total (AU)		18

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 #ES2003 E2S2 Biophere 4AU

BSc in Chemistry and Biological Chemistry with 2nd Major in Environmental Science (CHES)

AY2023 - 2024 Intake onwards

with Professional Internship and FYP

			ı	Number of Acad	lemic Units (AU	1)	
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	17/18*		9		3	29/30*
Chemistry and	2	21		8	3	6	38
Biological	3	18	3		2	21	44
Chemistry	4		19		10		29
	Total	56/57*	22	17	15	30/ [#] 31	140/141*

BSc in Chemistry and Biological Chemistry with 2nd Major in Environmental Science (CHES)

Category		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	4.7		
Interdisciplinary	CC0006 Sustainability: Society, Economy & Environment	3	17		
Collaborative	CC0007 Science & Technology for Humanity	3			
Core (ICC)	ML0004 Career and Entrepreneurial Development for the Future	2			
	Foundational Core (College-level)				
	HW0218 Communication Across the Sciences	2			
	PS0002 Introduction to Data Science and Artificial Intelligence	3	15		
	CM4081 Professional 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 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	56/57*		
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)				
	CM4080 Honours Project 1	10] ,,		
	4 x MPEs	12	22		

	1) ES1007 Climate Change or ES5007 Climate and Climate Change	3	
	2) ES3003 Introduction to Geochemistry	3	
	3) ES3802 The Urban Environment: Issue, Assessment, and		
	4) ES5001 Natural Hazards and Society	3	
	5) ES5006 Environmental Sustainability	3	
	Choose 5 Courses from the following list		
2nd Major in	1) ES2003 [#] E2S2 Biosphere	4	
Environmental	2) ES3801 Biogeochemistry	3	
Science (CHES)	3) ES5002 Emergent Life	3	30#
belefice (CITES)	4) ES5003 Blue Planet: How the Oceans Work	3	
	5) ES5005 Environmental Earth Systems Science	3	
	6) ES3203 (ES9003) The Genome and Society	3	
	7) EM5101 Environmental Quality	3	
	8) EM5103 Water Resource Management	3	
	9) EM5104 Air Quality Management	3	
	10) EM5105 Energy Resources Management	3	
	11) EM 5107 Environmental Health and Safety Management	3	
	12) EM5109 Environmental Issues and Sustainability	3	
	Students are responsible to plan for their 2nd major courses		
Total			140/14

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

^{*}Students taking ES2003 E2S2 Biophere will clock 31 AU under CHES

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

	Study Plan for AY2023-2024 intake sional Internship and FYP						
-	·				_		
Year 1 Sem	ester 1	T		Year 1 Sen	nester 2	T	
Course CM1001	Foundations of Chemistry I	Type C	<u>AU</u> 4	Course CM1002	Foundations of Chemistry II	Type C	AU 4
MH1802	Calculus for the Sciences	C	4	CM1804	Mathematics for Chemistry	C	2
	Inquiry and Communication in an				·		
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 & Wellbeing	CC	3	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
HW0001	Introduction to Academic Communicati	ion [#]		ES1007	Climate Change	BDE	3
			15				14/15
for studer	its who have not cleared QET						•
ear 2 Sem	ester 1			Year 2 Sen	nester 2		
Course		Туре	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	СС	3	ML0004	Career and Entrepreneurial Development for the Future World	СС	2
CC0007	Science & Technology for Humanity	CC	3	ES3802	The Urban Environment: Issue, Assessment and Management	BDE	3
ES5001	Natural Hazards and Society	BDE	3		Assessment and Management		
			21				17
Year 3 Sem	ester 1	T		Year 3 Sen	nester 2	T	
Course &	CLIENA Coura	Туре	AU	Course CM3xxx ^{&}	CHEM Core	Type	AU
CM3xxx ^{&}	CHEM-Core	С	3	CIVI3xxx	CHEM-Core Chemistry & Biological Chemistry	С	3
CM3xxx ^{&}	CHEM-Core	С	3	CM3061	Laboratory 3	С	3
CM3xxx ^{&}	CHEM-Core	С	3	HW0218	Communication Across the Sciences	FC	2
CM3062	Chemistry & Biological Chemistry	С	3	ES5006	Environmental Sustainability	BDE	3
	Laboratory 4			L33000			
ES3003	Introduction to Geochemistry	BDE	3		CHES Elective 3	BDE	3
	CHES Elective 1	BDE	3		CHES Elective 4	BDE	3
	CHES Elective 2	BDE	3		CHES Elective 5 CHEM MPE 1	BDE MPE	3
			21				23
Year 4 Sem	ester 1			Year 4 Sen	nester 2		
Course		Туре	AU	Course		Type	AU
CM4081	Professional Internship	FC	10	CM4080	Honours Project 1	MPE	10
					CHEM MPE 2	MPE	3
					CHEM MPE 3 CHEM MPE 4	MPE MPE	3
					CHEMINI L 4	IVIFL	
			10				19
					Total (AU)		140/14

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