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

AY2023 - 2024 Intake onwards

with Professional Internship

				Number of Acad	lemic Units (AU)	
Programme	Year of	Major Requirement		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			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	''			
Collaborative	CC0007 Science & Technology for Humanity	3				
Core (ICC)	ML0004 Career and Entrepreneurial Development for the Future Wo	orld 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				
	Laura a		 			
	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				
Major	CM2031 Organic and Bioorganic Chemistry	3	56/57*			
Requirement	CM2041 Physical and Biophysical Chemistry 1	3	30,37			
qu	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		
2md Mainnin	1) ES2003 [#] E2S2 Biosphere	4	
2nd Major in	2) ES3801 Biogeochemistry	3	
Environmental	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) 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)		
	Study Plan for AY2023-2024 intake	=			,		
with Profes.	ssional Internship						
					_		
Year 1 Sem	iester 1	Time	A11	Year 1 Sen	nester 2	Tuno	411
CM1001	Foundations of Chamistry I	Type C	AU 4	CM1002	Foundations of Chamistry II	Type C	AU 4
CM1001 MH1802	Foundations of Chemistry I Calculus for the Sciences	C	4	CM1002 CM1804	Foundations of Chemistry II Mathematics for Chemistry	C	4 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	СС	3	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
				ES1007	Climate Change	BDE	3
HW0001	Introduction to Academic Communicati	ion [#]			J		
			15				14/15*
# for studen	nts who have not cleared QET						,
Year 2 Som				Voor 2 Son			
Year 2 Sem Course	iester 1	Туре	AU	Year 2 Sen Course	nester Z	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 & Environment	СС	3	ML0004	Career and Entrepreneurial Development for the Future World	СС	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		Assessment and management		
			21				17
Year 3 Sem	nester 1			Year 3 Sen	nester 2		
Course	icater 1	Туре	AU	Course		Туре	AU
CM3xxx ^{&}	CHEM-Core	С	3	CM3xxx ^{&}	CHEM-Core	C	3
CM3xxx [®]	CHEM-Core	C	3	CM3xxx ^{&}	CHEM-Core	C	3
	Chemistry & Biological Chemistry				Chemistry & Biological Chemistry	_	
CM3062	Laboratory 4	С	3	CM3061	Laboratory 3	С	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	3				
-			24				20/21#
			24				20/21
Year 4 Sem	nester 1			Year 4 Sen	nester 2		
Course		Туре	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
					BDE 2	BDE	3
					BDE 3	BDE	3
-			10				18
					Total (AU)		139-141*
					,		190 1

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

FYP with Professional Attachment

			1	Number of Acad	demic Units (AU	1)	
Programme	Year of	Major Re	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 Inquiry and Communicati	on in the Interdisciplinary World	2			
	CC0002 Navigating the Digital Wo	orld	2			
	CC0003 Ethics & Civics in a Multi-	Cultural World	2			
	CC0005 Healthy Living & Wellbeir	ng	3	17		
Interdisciplinary	CC0006 Sustainability: Society, Ec	onomy & Environment	3	1/		
Collaborative	CC0007 Science & Technology for	Humanity	3			
Core (ICC)	AL0004 Career and Entrepreneur	ial Development for the Future	2			
	oundational Core (College-level)				
	HW0218 Communication Across t	he Sciences	2			
	S0002 Introduction to Data Scien	nce and Artificial Intelligence	3	10		
	CM4082 Professional Attachment		5			
	CHEM Core					
	CM1001 Foundations of Chemis	•	4			
	CM1002 Foundations of Chemis	•	4			
	MH1802 Calculus for the Scienc		4			
	CM1804 Mathematics for Chem		2			
	PH1011 Physics <u>or</u> PH1012* Ph	•	3/4*			
	CM2021 Inorganic and Bioinorg	anic Chemistry	3			
	CM2011 Analytical Chemistry		3			
	,	Chemistry Laboratory 1	3			
	S0001 Introduction to Compu	_	3			
Maian	CM2031 Organic and Bioorganic	•	3	57/58*		
Major	CM2041 Physical and Biophysic	The state of the s	3			
Requirement		Chemistry Laboratory 2	3			
	CM3011 ^{&} Chemical Spectroscopy	•	3			
	M3041 ^{&} Physical and Biophysic	al Chemistry 2	3			
	CM3062 Chemistry & Biological	Chemistry Laboratory 4	3			
	CM3031 ^{&} Organic Reaction Mech	nanisms and Synthesis	3			
	CM3021 ^{&} Organometallic Chemis	stry	3			
		Chemistry Laboratory 3	3			
	CHEM Major Prescribed Electives	s (MPE)		<u> </u>		
	CM4080 Honours Project 1		10	22		
	x MPEs		12			

Total			139-141*#
BDE	Any 2 BDE	4	4
	Students are responsible to plan for their 2nd major courses		
	12) EM5109 Environmental Issues and Sustainability	3	
	11) EM 5107 Environmental Health and Safety Management	3	
	10) EM5105 Energy Resources Management	3	
	9) EM5104 Air Quality Management	3	
	8) EM5103 Water Resource Management	3	
	7) EM5101 Environmental Quality	3	
	6) ES9003 The Genome and Society	3	
	5) ES5005 Environmental Earth Systems Science	3	
Science (CHES)	4) ES5003 Blue Planet: How the Oceans Work	3	55,52
Environmental	3) ES5002 Emergent Life	3	30/31#
2nd Major in	2) ES3801 Biogeochemistry	3	
	1) ES2003 [#] E2S2 Biosphere	4	
	Choose 5 Courses from the following list		
	5) ES5006 Environmental Sustainability	3	
	4) ES5001 Natural Hazards and Society	3	
	3) ES3802 The Urban Environment: Issue, Assessment, and	3	
	2) ES3003 Introduction to Geochemistry	3	
	Environmental Science Compulsory Courses 1) ES1007 Climate Change or ES5007 Climate and Climate Change	3	

^{*}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						
				V 4 C			
Year 1 Sem Course	ester 1	Туре	AU	Year 1 Sen Course	nester 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 or	С	3
CC0002	Navigating the Digital World	CC	2	PH1012*	Physics A (For students without 'A' Level Physics) Ethics & Civics in a Multi-Cultural	С	4
CC0005	Healthy Living & Wellbeing	CC	3	CC0003	World	CC	2
HW0001	Introduction to Academic Communicati	ion #		ES1007	Climate Change	BDE	3
							44/45
for studer	nts who have not cleared QET		15				14/15
Year 2 Sem	nester 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		-		
			21				17
					_		
Year 3 Sem	ester 1	T		Year 3 Sem	nester 2	-	
Course	CUENA	Туре	AU	Course	CUENA	Туре	AU
CM3xxx ^{&}	CHEM-Core	C	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
ES3003	Laboratory 4 Introduction to Geochemistry	BDE	3	ES5006	Laboratory 3 Environmental Sustainability	BDE	3
L33003	CHES Elective 1	BDE	3	L33000	CHES Elective 4	BDE	3/4#
	CHES Elective 2	BDE	3		CHES Elective 5	BDE	
	CHES Elective 3	BDE	3	HW0218	Communication Across the Sciences	FC	3 2
	BDE 1	BDE	2	1100210	communication Across the Sciences	10	2
	-	201	-	Year 3 Spe	cial Sem		
				CM4082	Professional Attachment	FC	5
			23				25/26
Year 4 Sem	nester 1			Year 4 Sen	nester 2		
Course	-	Туре	AU	Course	-	Туре	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				
			12				12
					Total (AU)		139-141

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	Major Requirement		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	21/22#	44/45#
Chemistry	4		19		10		29
	Total	56/57*	22	17	15	30/ [#] 31	140-142 ^{*#}

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			
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	1	T			
	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	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)					
	CM4080 Honours Project 1	10				
	4 x MPEs	12	22			
	+ V IAIL F2	12	1			

	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 (crizs)	4) ES5003 Blue Planet: How the Oceans Work	3	
	5) ES5005 Environmental Earth Systems Science	3	
	6) 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		
Гotal			140-142*

^{*}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.

with i rojes	sional Internship and FYP						
Year 1 Sem	ester 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
MH1802	Calculus for the Sciences	С	4	CM1804	Mathematics for Chemistry	С	2
CC0001	Inquiry and Communication in an interdisciplinary World	CC	2	PH1011/	Physics <u>or</u>	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	on #		ES1007	Climate Change	BDE	3
for studen	to who have not closered OFT		15				14/15
year 2 Sem	ts who have not cleared QET			Year 2 Sen	nastar 2		
rear 2 Sein Course		Туре	AU	Course	100101 2	Туре	AU
CM2011	Analytical and Bioanalytical Chemistry	C	3	CM2031	Organic and Bioorganic Chemistry	C	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	ester 1			Year 3 Sen	nester 2		
Course		Туре	AU	Course		Туре	AU
CM3xxx ^{&}	CHEM-Core	C	3	CM3xxx ^{&}	CHEM-Core	C	3
CM3xxx ^{&}	CHEM-Core	С	3	CM3061	Chemistry & Biological Chemistry Laboratory 3	С	3
CM3xxx ^{&}	CHEM-Core	С	3	HW0218	Communication Across the Sciences	FC	2
CM3062	Chemistry & Biological Chemistry Laboratory 4	С	3	ES5006	Environmental Sustainability	BDE	3
ES3003	Introduction to Geochemistry	BDE	3		CHES Elective 3	BDE	3/4#
	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				23/24
					_		
Year 4 Sem	ester 1	T	A	Year 4 Sen	nester 2	T	
Course CM4081	Professional Internship	Type FC	AU 10	Course CM4080	Honours Project 1	Type MPE	AU 10
CIVIHUOI	ו וטוכיאוטוומו ווונפווואוווף	i'C	10	CIVI4UOU	CHEM MPE 2	MPE	3
					CHEM MPE 3	MPE	3
					CHEM MPE 4	MPE	3
			10				19

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