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

AY2022 - 2023 Intake onwards

with Professional Internship

		Number of Academic Units (AU)								
Programme	Year of	Major Re	equirement	Interdisc	ciplinary	Broadening and				
	Study	Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)	Deepening Electives (BDE)	Total			
	1	17		9		8	34			
Chemistry and	2	21		8	3	6	38			
Biological	3	18			2	21	41			
Chemistry	4		12		10	6	28			
	Total	56	12	17	15	41	141			

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

Category			AU	Total AU			
	Common (	Core (University-level)					
	CC0001 In	2					
	CC0002 Na	avigating the Digital World	2				
	CC0003 Et	2					
	Common Core (University-level) CC0001 Inquiry and Communication in the Interdisciplinary World CC0002 Navigating the Digital World CC0003 Ethics & Civics in a Multi-Cultural World CC0005 Healthy Living & Wellbeing CC0006 Sustainability: Society, Economy & Environment CC0007 Science & Technology for Humanity ML0004 Career and Entrepreneurial Development for the Future World  Foundational Core (College-level) HW0218 Communication Across the Sciences PS0002 Introduction to Data Science and Artificial Intelligence CM4081 Professional Internship  CHEM Core CM1001 Foundations of Chemistry I CM1002 Foundations of Chemistry II MH1802 Calculus for the Sciences MH1804 Mathematics for Chemistry PH1801 Foundations of Physics I CM2021 Inorganic and Bioinorganic Chemistry CM2011 Analytical Chemistry CM2011 Introduction to Computational Thinking ajor CM2031 Organic and Biophysical Chemistry CM2041 Chemistry & Biological Chemistry Laboratory 2 CM3011 Chemistry & Biological Chemistry Laboratory 2 Chemical Spectroscopy and Applications	3					
Interdisciplinary	CC0006 Su	stainability: Society, Economy & Environment	3	17			
Collaborative	CC0007 Sc	ience & Technology for Humanity	3				
Core (ICC)		areer and Entrepreneurial Development for the Future	2				
		nal Core (College-level)					
	HW0218 C	communication Across the Sciences	2				
	PS0002 Int	roduction to Data Science and Artificial Intelligence	3	15			
	CM4081 P	rofessional Internship	10				
	1						
			1				
		-	4				
		-	4				
			4				
		•	2				
		· · · · · · · · · · · · · · · · · · ·	3				
			3				
		·	3				
			3				
			3				
Major			3	56			
Requirement			3				
			3				
			3				
		Physical and Biophysical Chemistry 2	3				
	CM3062	Chemistry & Biological Chemistry Laboratory 4	3				
		Organic Reaction Mechanisms and Synthesis	3				
			3				
	CM3061	Chemistry & Biological Chemistry Laboratory 3	3				
	CHEM Maj	or Prescribed Electives (MPE)					
	4 x MPEs		12	12			

	Environmental Science Compulsory Courses		
	1) ES1001 E2S2 Environment and Society	4	
	2) ES2003 E2S2 Biosphere	4	
	3) ES3003 Introduction to Geochemistry	3	
	4) ES5001 Natural Hazards, Climate Change and Society	3	
	5) ES5006 Environmental Sustainability	3	
		3	
	Choose 5 Courses from the following list		
	1) ES1007 Climate Change	3	
2nd Major in	2) ES3801 Biogeochemistry	3	
Environmental	3) ES3802 The Urban Environment: Issue, Assessment, and	3	22
Science (CHES)	4) ES5002 Emergent Life	3	32
	5) ES5003 Blue Planet: How the Oceans Work	3	
	6) ES5005 Environmental Earth Systems Science	3	
	7) ES9003 The Genome and Society	3	
	8) EM5101 Environmental Quality	3	
	9) EM5103 Water Resource Management	3	
	10) EM5104 Air Quality Management	3	
	11) EM5105 Energy Resources Management	3	
	12) EM 5107 Environmental Health and Safety Management	3	
	13) EM5109 Environmental Issues and Sustainability	3	
	Students are responsible to plan for their 2nd major courses	•	
BDE	Any 3 BDE	9	9
Total			141

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

with Profes	ssional Internship						
Vear 1 Sen	nester 1			Vear 1 Sen	nester 2		
Course	ilestel 1	Type	ΑU		Туре	AU	
CM1001	Foundations of Chemistry I				Foundations of Chemistry II	C	4
MH1802		C	4	MH1804	Mathematics for Chemistry	C	2
CC0001	Inquiry and Communication in an	66	2	DU14 004	•	6	2
CC0001	interdisciplinary World	CC	2	PH1801	Foundations of Physics I	С	3
CC0002	Navigating the Digital World	СС	2	CC0003	Ethics & Civics in a Multi-Cultural	CC	2
ES1001	Inquiry and Communication in an interdisciplinary World  Navigating the Digital World  E252 Environment and Society  BDE 4  CC0003  Ethics & Civics in a Multi World  World  CCC0005  Healthy Living & Wellbei E52003  E252 Biosphere   16  Introduction to Academic Communication*  Introduction to Ceared QET  Interest 1  Introduction to Ceared QET  Introduction to Computational Commistry Communication Computational Commistry Biological Chemistry Biological Communication Computational Communication Across to Chem Stelective 1  Introduction to Geochemistry BDE 3  CHES Elective 1  BDE 3  BDE 1  Professional Internship  FC 10  CHEM MPE1  CHEM MPE2  CHEM MPE3  CHEM MPE4  BDE 2  BDE 3		CC	3			
231001	2232 Environment and Society	DDL	-			BDE	4
HW0001	Introduction to Academic Communicati	ion*					
			16				18
*for studer	nts who have not cleared QET						
Year 2 Sen	nester 1			Year 2 Sen	nester 2		
Course		Туре	AU	Course		Туре	AU
CM2011		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		С	3	CM2062	Chemistry & Biological Chemistry Laboratory 2	С	3
PS0001	· · · · · · · · · · · · · · · · · · ·	С	3	PS0002	_	FC	3
CC0006		СС	3	ML0004	Career and Entrepreneurial  Development for the Future World	CC	2
CC0007		CC	3	ES5006	Environmental Sustainability	BDE	3
ES5001	<del>-</del>	BDE	3				
			21				17
Vaar 3 San	nester 1			Vaar 3 San	nester 7		
Course	ilestei 1	Tyne	ΛII		iestei Z	Туре	AU
CM3xxx <sup>&amp;</sup>	CHFM-Core				CHFM-Core	C	3
CM3xxx <sup>&amp;</sup>						C	3
CM3062	Chemistry & Biological Chemistry				Chemistry & Biological Chemistry	С	3
	•				•		
ES3003	· · · · · · · · · · · · · · · · · · ·					BDE	3
						BDE BDE	3 3
				HW0218	Communication Across the Sciences	FC	2
			21				20
					_		
Year 4 Sen	nester 1	Typo	AH		nester 2	Typo	ΔII
Course CM4081	Professional Internship			course	CHEM MDE1	Type MPE	<b>AU</b> 3
CIVI4U0I	i roressional internship	rc	10			MPE	3
						MPE	3
						MPE	3
						BDE	3
						BDE	3
			10				18
					Total (AU)		141

This study plan is meant as a guide.

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

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

AY2022 - 2023 Intake onwards

FYP with Professional Attachment

Programme		Number of Academic Units (AU)							
	Year of	Major Requirement		Interdisciplinary		Broadening and			
	Study	Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)	Deepening Electives (BDE)	Total		
	1	17		9		8	34		
Chemistry and	2	21		8	3	6	38		
Biological	3	18			7	20	45		
Chemistry	4		22			2	24		
	Total	56	22	17	10	36	141		

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

Category			AU	Total AU		
	Common (	Core (University-level)				
	CC0001 Inc	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	3	17			
Interdisciplinary	CC0006 Su	stainability: Society, Economy & Environment	3	1/		
Collaborative	CC0007 Sc	ience & Technology for Humanity	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			
	CUENA C					
	CHEM Core CM1001	e Foundations of Chemistry I	4			
		Foundations of Chemistry II	4			
		Calculus for the Sciences	4			
		Mathematics for Chemistry	2			
		Foundations of Physics I	3			
		Inorganic and Bioinorganic Chemistry	3			
		Analytical Chemistry	3			
	CM2061	Chemistry & Biological Chemistry Laboratory 1	3			
	PS0001	Introduction to Computational Thinking	3			
	CM2031	Organic and Bioorganic Chemistry	3	56		
Major		Physical and Biophysical Chemistry 1	3			
Requirement		Chemistry & Biological Chemistry Laboratory 2	3			
			3			
		Physical and Biophysical Chemistry 2	3			
	CM3062	Chemistry & Biological Chemistry Laboratory 4	3			
	CM3031 <sup>&amp;</sup>	Organic Reaction Mechanisms and Synthesis	3			
		Organometallic Chemistry	3			
	CM3061	Chemistry & Biological Chemistry Laboratory 3	3			
	CHEM Maj	or Prescribed Electives (MPE)		<u> </u>		
		Honours Project 1	10	22		
	4 x MPEs		12			

	1) ES1001 E2S2 Environment and Society	4	
	1, 231001 2202 21111 office and oddiety	4	
	2) ES2003 E2S2 Biosphere	4	
	3) ES3003 Introduction to Geochemistry	3	
	4) ES5001 Natural Hazards, Climate Change and Society	3	
	5) ES5006 Environmental Sustainability	3	
	Choose 5 Courses from the following list		
	1) ES1007 Climate Change	3	
2nd Major in Environmental Science (CHES)	2) ES3801 Biogeochemistry	3	
	3) ES3802 The Urban Environment: Issue, Assessment, and	2	
	Management	3	32
	4) ES5002 Emergent Life	3	
	5) ES5003 Blue Planet: How the Oceans Work	3	
	6) ES5005 Environmental Earth Systems Science	3	
	7) ES9003 The Genome and Society	3	
	8) EM5101 Environmental Quality	3	
	9) EM5103 Water Resource Management	3	
	10) EM5104 Air Quality Management	3	
	11) EM5105 Energy Resources Management	3	
	12) EM 5107 Environmental Health and Safety Management	3	
	13) EM5109 Environmental Issues and Sustainability	3	
	Students are responsible to plan for their 2nd major courses		
DE	Any 2 BDE	4	4

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

Year 1 Semester 1 Course CM1001 Foundations MH1802 Calculus for 1 Inquiry and 0 interdisciplin CC0002 Navigating the ES1001 E2S2 Environ  *for students who have not Year 2 Semester 1 Course CM2011 Analytical an Chemistry CM2021 Inorganic an CM2061 Chemistry & Laboratory 1 Introduction  Thinking CC0006 Sustainability Environment CC0007 Science & Te Natural Haza Society  Year 3 Semester 1 Course CM3xxx CHEM-Core CM3xxx CHEM-Core CM3062 Chemistry & Laboratory 4	nd Biological Chemistry with 2nd	d Major i	n Environme	ntal Science (CHI	ES)		
Year 1 Semester 1 Course  CM1001 Foundations MH1802 Calculus for 3 CC0001 Inquiry and 0 interdisciplin CC0002 Navigating the ES1001 E2S2 Environ  *for students who have not  *for students who have not  Year 2 Semester 1 Course  CM2011 Analytical and Chemistry CM2021 Inorganic and CM2061 Chemistry & Laboratory 1 PS0001 Introduction Thinking CC0006 Sustainability Environment CC0007 Science & Te Natural Haza Society  Year 3 Semester 1 Course  CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHEM MPE1 CHEM MPE1 CHEM MPE2	Plan for AY2022-2023 intake						
Course  CM1001 Foundations MH1802 Calculus for 1 CC0001 Inquiry and 0 interdisciplin CC0002 Navigating the ES1001 E2S2 Environ  *for students who have not  *for students who have not  Year 2 Semester 1 Course  CM2011 Analytical and Chemistry CM2021 Inorganic and CM2061 Chemistry & Laboratory 1 Introduction Thinking CC0006 Sustainability Environment CC0007 Science & Te Natural Haza Society  Year 3 Semester 1 Course  CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3062 Laboratory 4 ES3003 Introduction CHES Elective CHEM MPE1 CHEM MPE2 CHEM MPE2	nal Attachment Option						
CM1001 Foundations MH1802 Calculus for 1 CC0001 Inquiry and 0 interdisciplin CC0002 Navigating the ES1001 E2S2 Environ  *for students who have not  *for students who have not  Year 2 Semester 1 Course  CM2011 Analytical and Chemistry CM2021 Inorganic and CM2061 Chemistry & Laboratory 1 PS0001 Introduction Thinking CC0006 Sustainability Environment CC0007 Science & Te ES5001 Science & Te Society  Year 3 Semester 1 Course  CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3c2 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHEM MPE1 Course  CHEM MPE1 CHEM MPE2				Year 1 Sen	nester 2		
MH1802 Calculus for a Inquiry and C interdisciplin CC0002 Navigating the ES1001 E2S2 Enviror    ##W0001 Introduction    #for students who have not the students who have not t		Туре	AU	Course		Туре	AU
CCO001 Inquiry and 0 interdisciplin CC0002 Navigating the ES1001 E2S2 Enviror Introduction  *for students who have not the Forestand Introduction Chemistry CM2021 Inorganic and Chemistry CM2021 Introduction Thinking CC0006 Sustainability Environment CC0007 Science & Temperature Tourse CM3xxx CHEM-Core CM3xxx CHEM-Core CM3xxx CHEM-Core CM3xxx CHEM-Core CM3062 Laboratory 4 ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course CHEM MPE1 CHEM MPE2 CHEM MPE2 CHEM MPE2	dations of Chemistry I	С	4	CM1002	Foundations of Chemistry II	С	4
interdisciplin CC0002 Navigating the ES1001 E2S2 Enviror  HW0001 Introduction  *for students who have not Year 2 Semester 1 Course  CM2011 Analytical an Chemistry CM2021 Inorganic an CM2061 Chemistry & Laboratory 1 PS0001 Introduction Thinking CC0006 Environment CC0007 Science & Te ES5001 Society  Year 3 Semester 1 Course  CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3c2 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHEM MPE1 COurse  CHEM MPE1 CHEM MPE2	lus for the Sciences	С	4	MH1804	Mathematics for Chemistry	С	2
ES1001 E2S2 Environ  #for students who have not the students of the students who have not the st	ry and Communication in an lisciplinary World	СС	2	PH1801	Foundations of Physics I	С	3
*for students who have not a course  CM2011 Analytical and Chemistry  CM2021 Inorganic and Chemistry & Laboratory 1 Introduction Thinking  CC0006 Sustainability Environment CC0007 Science & Temperature Temperat	ating the Digital World	CC	2	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
*for students who have not Year 2 Semester 1 Course  CM2011 Analytical and Chemistry  CM2021 Inorganic and Chemistry & Laboratory 1 PS0001 Introduction Thinking CC0006 Sustainability Environment CC0007 Science & Te ES5001 Society  Year 3 Semester 1 Course  CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3c2 Laboratory 4 ES3003 Introduction CHES Electivy CHES Electivy CHES Electivy BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE1 CHEM MPE2	Environment and Society	BDE	4	CC0005 ES2003	Healthy Living & Wellbeing E2S2 Biosphere	CC BDE	3 4
Year 2 Semester 1 Course  CM2011 Analytical an Chemistry  CM2021 Inorganic an  CM2061 Chemistry & Laboratory 1 Introduction Thinking  CC0006 Sustainability Environment  CC0007 Science & Te ES5001 Society  Year 3 Semester 1 Course  CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3c2 Chemistry & Laboratory 4 ES3003 Introduction CHES Electivy CHES Electivy CHES Electivy BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE1 CHEM MPE2	luction to Academic Communicat	ion*					
Year 2 Semester 1 Course  CM2011 Analytical an Chemistry  CM2021 Inorganic an  CM2061 Chemistry & Laboratory 1 Introduction Thinking  CC0006 Sustainability Environment  CC0007 Science & Te ES5001 Society  Year 3 Semester 1 Course  CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3c2 Chemistry & Laboratory 4 ES3003 Introduction CHES Electivy CHES Electivy CHES Electivy BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE1 CHEM MPE2			16				18
Course  CM2011 Analytical an Chemistry  CM2021 Inorganic an  CM2061 Chemistry & Laboratory 1  PS0001 Introduction Thinking  CC0006 Sustainability Environment  CC0007 Science & Te ES5001 Society  Year 3 Semester 1  Course  CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3xxx & CHEM-Core CM3c2 Chemistry & Laboratory 4  ES3003 Introduction CHES Electivy CHES Electivy CHES Electivy BDE 1  Year 4 Semester 1  Course  CHEM MPE1 CHEM MPE1 CHEM MPE2	have not cleared QET						
CM2011 Analytical an Chemistry CM2021 Inorganic an CM2061 Chemistry & Laboratory 1 PS0001 Introduction Thinking CC0006 Sustainability Environment CC0007 Science & Te ES5001 Society  Year 3 Semester 1 Course CM3xxx CHEM-Core CM3xxx CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Electivy CHES Electivy BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE2				Year 2 Sen	nester 2		
CM2011 Chemistry  CM2021 Inorganic an  CM2061 Chemistry & Laboratory 1  PS0001 Introduction Thinking  CC0006 Sustainability Environment  CC0007 Science & Te  Natural Haza Society  Year 3 Semester 1  Course  CM3xxx CHEM-Core  CM3xxx CHEM-Core  CM3062 Chemistry & Laboratory 4  ES3003 Introduction  CHES Elective		Туре	AU	Course		Туре	AU
CM2021 Inorganic an  CM2061 Chemistry & Laboratory 1  PS0001 Introduction Thinking  CC0006 Sustainability Environment  CC0007 Science & Te  Society  Year 3 Semester 1  Course  CM3xxx CHEM-Core  CM3xxx CHEM-Core  CM3062 Chemistry & Laboratory 4  ES3003 Introduction  CHES Elective	tical and Bioanalytical istry	С	3	CM2031	Organic and Bioorganic Chemistry	С	3
Laboratory 1 PS0001 Introduction Thinking CC0006 Sustainability Environment CC0007 Science & Te ES5001 Society  Year 3 Semester 1 Course CM3xxx CHEM-Core CM3xxx CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Electivy CHES Electivy BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE1 CHEM MPE2	anic and Bioinorganic Chemistry	С	3	CM2041	Physical and Biophysical Chemistry 1	С	3
PS0001 Introduction Thinking CC0006 Sustainability Environment CC0007 Science & Te ES5001 Natural Haza Society  Year 3 Semester 1 Course CM3xxx® CHEM-Core CM3xxx® CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Electivy CHES Electivy BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE2	istry & Biological Chemistry atory 1	С	3	CM2062	Chemistry & Biological Chemistry Laboratory 2	С	3
Environment CC0007 Science & Te ES5001 Society  Year 3 Semester 1 Course CM3xxx® CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE1 CHEM MPE2	luction to Computational	С	3	PS0002	Introduction to Data Science and Artificial Intelligence	FC	3
Year 3 Semester 1 Course CM3xxx® CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE2	inability: Society, Economy &	CC	3	ML0004	Career and Entrepreneurial  Development for the Future World	СС	2
Year 3 Semester 1 Course CM3xxx® CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE2	ce & Technology for Humanity	CC	3	ES5006	Environmental Sustainability	BDE	3
Course  CM3xxx <sup>&amp;</sup> CHEM-Core CM3xxx <sup>&amp;</sup> CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE2	al Hazards, Climate Change and ty	BDE	3				
Course  CM3xxx <sup>&amp;</sup> CHEM-Core CM3xxx <sup>&amp;</sup> CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE2			21				17
Course  CM3xxx <sup>&amp;</sup> CHEM-Core CM3xxx <sup>&amp;</sup> CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE2				V26			
CM3xxx <sup>&amp;</sup> CHEM-Core CM3xxx <sup>&amp;</sup> CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course CHEM MPE1 CHEM MPE2		Typo	AU	Year 3 Sen Course	nester 2	Type	AU
CM3xxx <sup>&amp;</sup> CHEM-Core CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course CHEM MPE1 CHEM MPE2	1 Coro	<b>Type</b> C	3	CM3xxx <sup>&amp;</sup>	CHEM-Core	<b>Type</b> C	3
CM3062 Chemistry & Laboratory 4 ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE2		С	3	CM3xxx <sup>&amp;</sup>	CHEM-Core	С	3
ES3003 Introduction CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course  CHEM MPE1 CHEM MPE2	istry & Biological Chemistry	С	3	CM3061	Chemistry & Biological Chemistry	С	3
CHES Elective CHES Elective BDE 1  Year 4 Semester 1 Course CHEM MPE1 CHEM MPE2	•	חחר	2		Laboratory 3	פסר	2
CHES Elective BDE 1  Year 4 Semester 1 Course CHEM MPE1 CHEM MPE2	fluction to Geochemistry	BDE	3		CHES Elective 3	BDE	3
Year 4 Semester 1 Course CHEM MPE1 CHEM MPE2		BDE	3		CHES Elective 4	BDE	3
Course  CHEM MPE1  CHEM MPE2		BDE BDE	3 2	HW0218	CHES Elective 5 Communication Across the Sciences	BDE FC	3 2
Course  CHEM MPE1  CHEM MPE2				Year 3 Spe	<u>cial Sem</u>		
Course  CHEM MPE1  CHEM MPE2				CM4082	Professional Attachment	FC	5
Course  CHEM MPE1  CHEM MPE2			20				25
Course  CHEM MPE1  CHEM MPE2							
CHEM MPE1 CHEM MPE2		Туре	AU	Year 4 Sen Course	nester 2	Туре	AU
CHEM MPE2	1 MPE1	MPE	3	CM4080	Honours Project 1	MPE	10
		MPE	3	C	BDE 2	BDE	2
		MPE	3			DDL	_
CHEM MPE4		MPE	3				
			12				12
					Total (AU)		141

This study plan is meant as a guide.

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

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

AY2022 - 2023 Intake onwards

with Professional Internship and FYP

Programme		Number of Academic Units (AU)								
	Year of	Major Requirement		Interdisciplinary		Broadening and				
	Study	Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)	Deepening Electives (BDE)	Total			
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Chemistry	4		19		10		29			
	Total	56	22	17	15	32	142			

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	
	Common Core (University-level) CC0001 Inquiry and Communication in the Interdisciplinary World CC0002 Navigating the Digital World CC0003 Ethics & Civics in a Multi-Cultural World CC0005 Healthy Living & Wellbeing CC0006 Sustainability: Society, Economy & Environment aborative ire (ICC)  CC0007 Science & Technology for Humanity ML0004 Career and Entrepreneurial Development for the Future  Foundational Core (College-level) HW0218 Communication Across the Sciences PS0002 Introduction to Data Science and Artificial Intelligence CM4081 Professional Internship  CM1002 MH1802 MH1804 PH1801 CM2021 CM2031 Major uirement  Major uirement  Major CM2031 CM2031 CM2031 CM2031 CM2031 CM2031 CM2031 CM2031 CM3041 CM3041 CM3041 CM3042 CM3041 CM3062 CM3041 CM3041 CM3041 CM3062 CM3041 CM3064 CM3065 CM3041 CM3066 CM3067 CM3		2	
	CC0005 He	3	17	
Interdisciplinary	Common Core (University-level) CC0001 Inquiry and Communication in the Interdisciplinary World CC0002 Navigating the Digital World CC0003 Ethics & Civics in a Multi-Cultural World CC0005 Healthy Living & Wellbeing CC0006 Sustainability: Society, Economy & Environment CC0007 Science & Technology for Humanity ML0004 Career and Entrepreneurial Development for the Future  Foundational Core (College-level) HW0218 Communication Across the Sciences PS0002 Introduction to Data Science and Artificial Intelligence CM4081 Professional Internship  CHEM Core  CM1001 Foundations of Chemistry I CM1002 Foundations of Chemistry II CM1002 Foundations of Chemistry II CM1003 Mathematics for Chemistry PH1801 Foundations of Physics I CM2021 Inorganic and Bioinorganic Chemistry CM2011 Analytical Chemistry CM2061 PS0001 Introduction to Computational Thinking CM2031 Organic and Biophysical Chemistry CM2041 CM2041 Chemistry & Biological Chemistry Laboratory 1 CM2041 CM2042 Chemistry & Biological Chemistry Laboratory 2 CM3011 <sup>&amp;</sup> CM2041 Urrement CM2041 Chemistry & Biological Chemistry Laboratory 2 Chemical Spectroscopy and Applications Physical and Biophysical Chemistry 2	3	1/	
Collaborative		3		
Core (ICC)	ML0004 C	areer and Entrepreneurial Development for the Future	2	
ategory nterdisciplinary Collaborative	Foundatio	nal Core (College-level)		
	HW0218 C	Communication Across the Sciences	2	1
	PS0002 Int	troduction to Data Science and Artificial Intelligence	3	15
	CM4081 P	rofessional Internship	10	
	<b>CHEM Cor</b>	e		
	CM1001	Foundations of Chemistry I	4	
	CM1002	Foundations of Chemistry II	4	
	MH1802	Calculus for the Sciences	4	
	MH1804	Mathematics for Chemistry	2	
	PH1801	Foundations of Physics I	3	
	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
	CM2041	Physical and Biophysical Chemistry 1	3	
Requirement	CM2062	Chemistry & Biological Chemistry Laboratory 2	3	
	CM3011 <sup>&amp;</sup>	Chemical Spectroscopy and Applications	3	
	CM3041 <sup>&amp;</sup>	Physical and Biophysical Chemistry 2	3	
	CM3062	Chemistry & Biological Chemistry Laboratory 4	3	
	CM3031 <sup>&amp;</sup>	Organic Reaction Mechanisms and Synthesis	3	
	CM3021 <sup>&amp;</sup>	Organometallic Chemistry	3	
	CM3061	Chemistry & Biological Chemistry Laboratory 3	3	
	CHEM Ma	l jor Prescribed Electives (MPE)	1	
	CM4080	Honours Project 1	10	22
	4 x MPEs		12	22

	Environmental Science Compulsory Courses		
	1) ES1001 E2S2 Environment and Society	4	
	2) ES2003 E2S2 Biosphere	4	
	3) ES3003 Introduction to Geochemistry	3	
	4) ES5001 Natural Hazards, Climate Change and Society	3	
	5) ES5006 Environmental Sustainability	3	
	Choose 5 Courses from the following list		
	1) ES1007 Climate Change	3	
2nd Major in	2) ES3801 Biogeochemistry	3	
2nd Major in Environmental Science (CHES)	3) ES3802 The Urban Environment: Issue, Assessment, and	3	
	Management	3	32
Science (CHLS)	4) ES5002 Emergent Life	3	
	5) ES5003 Blue Planet: How the Oceans Work	3	
	6) ES5005 Environmental Earth Systems Science	3	
	7) ES9003 The Genome and Society	3	
	8) EM5101 Environmental Quality	3	
	9) EM5103 Water Resource Management	3	
	10) EM5104 Air Quality Management	3	
	11) EM5105 Energy Resources Management	3	
	12) EM 5107 Environmental Health and Safety Management	3	
	13) EM5109 Environmental Issues and Sustainability	3	
	Students are responsible to plan for their 2nd major courses		
Total			142

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

BSc in Cher	mistry and Biological Chemistry with 2nd	d Major i	n Environme	ntal Science (CHI	ES)		
Suggested	Study Plan for AY2022-2023 intake						
with Profes	sional Internship and FYP						
Year 1 Sem	nester 1			Year 1 Sen	nester 2		
Course		Туре	AU	Course			AU
CM1001	Foundations of Chemistry I	С	4	CM1002	Foundations of Chemistry II	С	4
MH1802	Calculus for the Sciences Inquiry and Communication in an	С	4	MH1804	Mathematics for Chemistry	С	2
CC0001	interdisciplinary World	CC	2	PH1801	Foundations of Physics I	С	3
CC0002	Navigating the Digital World	CC	2	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
ES1001	E2S2 Environment and Society	BDE	4	CC0005 ES2003	Healthy Living & Wellbeing E2S2 Biosphere	CC BDE	3 4
HW0001	Introduction to Academic Communicati	ion*					
*6	the death of the desired OFT		16				18
*Jor stuaen	its who have not cleared QET						
Year 2 Sem	ester 1			Year 2 Sen	nester 2		
Course	Analytical and Disconlytical	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	CC	3	ML0004	Career and Entrepreneurial  Development for the Future World	CC	2
CC0007	Science & Technology for Humanity	CC	3	ES5006	Environmental Sustainability	BDE	3
ES5001	Natural Hazards, Climate Change and Society	BDE	3				
			21				17
Voor 3 Com	saakau 1			Voor 2 Com	tou 3		
Year 3 Sem Course	iester 1	Туре	AU	Year 3 Sen Course	iester 2	Туре	AU
CM3xxx <sup>&amp;</sup>	CHEM-Core	C	3	CM3xxx <sup>&amp;</sup>	CHEM-Core	С	3
CM3xxx <sup>&amp;</sup>	CHEM-Core	С	3	CM3xxx <sup>&amp;</sup>	CHEM-Core	С	3
CM3041	Physical and Biophysical Chemistry 2	С	3	HW0218	Communication Across the Sciences	FC	2
CM3062	Chemistry & Biological Chemistry Laboratory 4	С	3		CHES Elective 3	BDE	3
ES3003	Introduction to Geochemistry	BDE	3		CHES Elective 4	BDE	3
200000	CHES Elective 1	BDE	3		CHES Elective 5	BDE	3
	CHES Elective 2	BDE	3		CHEM MPE 1	MPE	3
			21				20
Year 4 Sem	nester 1			Year 4 Sen	nester 2		
Course		Туре	AU	Course		Туре	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 3
			10				19

This study plan is meant as a guide.

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