

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

AY2023 - 2024 Intake onwards

with Professional Internship

Programme	Year of Study	Number of Academic Units (AU)					Broadening and Deepening Electives (BDE)	Total
		Major Requirement		Interdisciplinary				
		Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)			
Chemistry and Biological Chemistry	1	17/18*		9		3	29/30*	
	2	21		8	3	6	38	
	3	18			2	24/25 [#]	44/45 [#]	
	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
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 Environmental Science (CHES)	Environmental Science Compulsory Courses			
	1) ES1007 Climate Change or ES5007 Climate and Climate Change	3	30/31 [#]	
	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			
	1) ES2003 [#] E2S2 Biosphere	4		
	2) ES3801 Biogeochemistry	3		
	3) ES5002 Emergent Life	3		
	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			
<i>Students are responsible to plan for their 2nd major courses</i>				
BDE	Any 3 BDE	9	9	
Total			139-141^{*#}	

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

Students taking ES2003 E2S2 Biosphere will clock 31 AU.

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

BSc in Chemistry and Biological Chemistry with 2nd Major in Environmental Science (CHES)							
Suggested Study Plan for AY2023-2024 intake							
<i>with Professional Internship</i>							
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 an interdisciplinary World	CC	2	PH1011/	Physics <u>or</u>	C	3
CC0002	Navigating the Digital World	CC	2	PH1012*	Physics A (For students without 'A' Level Physics)	C	4
CC0005	Healthy Living & Wellbeing	CC	3	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
HW0001	Introduction to Academic Communication [#]			ES1007	Climate Change	BDE	3
			15				14/15*
[#] 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	ML0004	Career and Entrepreneurial Development for the Future World	CC	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				17
			21				17
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
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				20/21[#]
			24				20/21[#]
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
					BDE 2	BDE	3
					BDE 3	BDE	3
			10				18
						Total (AU)	139-141*[#]

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

[#]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

Programme	Year of Study	Number of Academic Units (AU)					Total
		Major Requirement		Interdisciplinary		Broadening and Deepening Electives (BDE)	
		Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)		
Chemistry and Biological Chemistry	1	17/18*		9		3	29/30*
	2	21		8	3	6	38
	3	18			7	23/24 [#]	48/49 [#]
	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
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	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	57/58*
	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)		
CM4080 Honours Project 1	10	22	
4 x MPEs	12		

2nd Major in Environmental Science (CHES)	Environmental Science Compulsory Courses				
	1) ES1007 Climate Change or ES5007 Climate and Climate Change	3	30/31 [#]		
	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				
	1) ES2003 [#] E2S2 Biosphere	4			
	2) ES3801 Biogeochemistry	3			
	3) ES5002 Emergent Life	3			
	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				
<i>Students are responsible to plan for their 2nd major courses</i>					
BDE	Any 2 BDE	4	4		
Total			139-141^{*#}		

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

Students taking ES2003 E2S2 Biophere will clock 31 AU.

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

BSc in Chemistry and Biological Chemistry with 2nd Major in Environmental Science (CHES)							
Suggested Study Plan for AY2023-2024 intake							
<i>FYP with Professional Attachment Option</i>							
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 an interdisciplinary World	CC	2	PH1011/	Physics <u>or</u>	C	3
CC0002	Navigating the Digital World	CC	2	PH1012*	Physics A (For students without 'A' Level Physics)	C	4
CC0005	Healthy Living & Wellbeing	CC	3	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
HW0001	Introduction to Academic Communication [#]			ES1007	Climate Change	BDE	3
			15				14/15*
<i># for students who have not cleared QET</i>							
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	ML0004	Career and Entrepreneurial Development for the Future World	CC	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 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
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				
			23				
Year 3 Special Sem							
CM4082	Professional Attachment					FC	5
							25/26[#]
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				
			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).*

& 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

Programme	Year of Study	Number of Academic Units (AU)					Total
		Major Requirement		Interdisciplinary		Broadening and Deepening Electives (BDE)	
		Core (C)	Major PE (MPE)	Common Core (CC)	Foundational Core (FC)		
Chemistry and Biological Chemistry	1	17/18*		9		3	29/30*
	2	21		8	3	6	38
	3	18	3		2	21/22 [#]	44/45 [#]
	4		19		10		29
	Total	56/57*	22	17	15	30/ [#] 31	140-142 ^{*#}

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	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	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)		
CM4080 Honours Project 1	10	22	
4 x MPEs	12		

2nd Major in Environmental Science (CHES)	Environmental Science Compulsory Courses			
	1) ES1007 Climate Change or ES5007 Climate and Climate Change	3	30/31 [#]	
	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			
	1) ES2003 [#] E2S2 Biosphere	4		
	2) ES3801 Biogeochemistry	3		
	3) ES5002 Emergent Life	3		
	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			
<i>Students are responsible to plan for their 2nd major courses</i>				
Total			140-142^{*#}	

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

Students taking ES2003 E2S2 Biophere will clock 31 AU.

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

BSc in Chemistry and Biological Chemistry with 2nd Major in Environmental Science (CHES)							
Suggested Study Plan for AY2023-2024 intake							
<i>with Professional Internship and FYP</i>							
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 an 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 & Wellbeing	CC	3	CC0003	Ethics & Civics in a Multi-Cultural World	CC	2
HW0001	<i>Introduction to Academic Communication</i> #			ES1007	Climate Change	BDE	3
			15				14/15*
# 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	ML0004	Career and Entrepreneurial Development for the Future World	CC	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 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	HW0218	Communication Across the Sciences	FC	2
CM3062	Chemistry & Biological Chemistry Laboratory 4	C	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		BDE	3
			21	CHES Elective 6		MPE	3
							23/24[#]
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)	140-142*[#]

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

[#]ES2003 E2S2 Biophere 4AU