

ENVIRONMENTAL CHEMISTRY – SPECIALIZATION (SCIENCE) – BACHELOR OF SCIENCE (HONOURS)

ECHM-P-BSH

Subject: Administered by the School of Environmental Studies in partnership with the Department of Chemistry.

Plan: Consists of 102.00 units as described below.

Program: The Plan, with sufficient electives to total 120.00 units, will lead to a Bachelor of Science (Honours) Degree.

Note: Requirements for this program have been modified. Please consult the 2023-2024 (<https://queensu-ca-public.courseleaf.com/archive/2023-2024/>) *Calendar* for the previous requirements.

Code	Title	Units
------	-------	-------

1. Core

– CORE SCIENCE –

A. Complete 3.00 units from the following: 3.00

BIOL 103	Fundamentals of Biology: Organisms to Ecosystems	
----------	--	--

BIOL 111	Ecology and the Environment	
----------	-----------------------------	--

B. Complete 6.00 units from the following: 6.00

CHEM 109	General Chemistry I: From Atoms to & CHEM 110 Matter and General Chemistry II: Thermodynamics and Kinetics	
----------	--	--

or

CHEM 112	General Chemistry	
----------	-------------------	--

C. Complete the following:

GPHY 101	Human Geography	3.00
----------	-----------------	------

GPHY 102	Physical Geography and Natural Resources	3.00
----------	--	------

D. Complete 3.00 units from the following: 3.00

GEOL 104	The Dynamic Earth	
----------	-------------------	--

GEOL 107	History of Life	
----------	-----------------	--

E. Complete 6.00 units from the following: 6.00

MATH 120	Differential and Integral Calculus	
----------	------------------------------------	--

or

MATH 121	Differential and Integral Calculus	
----------	------------------------------------	--

or

MATH 123	Differential and Integral Calculus I & MATH 124 and Differential and Integral Calculus II	
----------	---	--

– CORE ENVIRONMENTAL CHEMISTRY –

F. Complete 6.00 units from the following: 6.00

PHYS 104	Fundamental Physics	
----------	---------------------	--

or

PHYS 106	General Physics	
----------	-----------------	--

or

PHYS 115	Introduction to Physics I & PHYS 116 and Introduction to Physics II	
----------	---	--

G. Complete the following:

CHEM 211	Main Group Chemistry	3.00
----------	----------------------	------

CHEM 212	Principles of Chemical Reactivity	3.00
----------	-----------------------------------	------

CHEM 213	Introduction to Chemical Analysis	3.00
----------	-----------------------------------	------

CHEM 221	Material, Solutions, and Interfaces	3.00
----------	-------------------------------------	------

CHEM 222	Methods of Structure Determination	3.00
----------	------------------------------------	------

CHEM 223	Organic Reactions	3.00
----------	-------------------	------

H. Complete the following:

CHEM 311	Mechanistic Organic Chemistry	3.00
----------	-------------------------------	------

CHEM 312	Transition Metal Chemistry	3.00
----------	----------------------------	------

CHEM 323	Biological Chemistry	3.00
----------	----------------------	------

CHEM 326	Environmental and Green Chemistry	3.00
----------	-----------------------------------	------

I. Complete the following:

CHEM 321	Instrumental Chemical Analysis	3.00
----------	--------------------------------	------

J. Complete the following:

CHEM 397	Experimental Chemistry	6.00
----------	------------------------	------

K. Complete the following:

CHEM 497	Research Project	6.00
----------	------------------	------

– CORE SOCIAL SCIENCES AND HUMANITIES –

L. Complete the following:

ENSC 103	Environment and Sustainability	3.00
----------	--------------------------------	------

M. Complete the following:

ENSC 230	Principles of Sustainability	3.00
----------	------------------------------	------

ENSC 330	Applications of Sustainability	3.00
----------	--------------------------------	------

N. Complete 6.00 units from the following: 6.00

ENSC 430	Honours Projects in Environmental Sustainability	
----------	--	--

ENSC 501	Independent Environmental Study	
----------	---------------------------------	--

2. Option

A. Complete 3.00 units from the following course list: 3.00

ENSC_Specialization_Options_A		
-------------------------------	--	--

B. Complete 3.00 units from the following: 3.00

GEOL at any level		
-------------------	--	--

C. Complete 3.00 units from the following: 3.00

BIOL 200	Diversity of Life	
----------	-------------------	--

BIOL 212	Scientific Methods in Biology	
----------	-------------------------------	--

ENSC_Specialization_Options_B		
-------------------------------	--	--

D. Complete 3.00 units from the following course list: 3.00



ENSC_Interdisciplinary_Humanities	
Electives	
Elective Courses	18.00
Total Units	120.00

3. Substitutions

A. Students who have completed CHEM 113 and CHEM 114 may take CHEM 117 to gain general chemistry laboratory experience. While this sequence totals 7.50 units, it is considered equivalent to CHEM 112 and may be used to fulfill **Core 1.B.** of the Environmental Chemistry Specialization Plan when applicable; the additional 1.50 units will be directed to the student's elective requirement.

B. ENSC 502 may be substituted for requirement **Core 1.N.** and a further 6.00 units in electives and/or Plan requirements as approved by the Chair of Undergraduate Studies.

4. Notes

A. A maximum of 6.00 units from courses offered by other Faculties and Schools may be counted toward the program and/or Plan requirements. This includes courses in BMED, COMM, GLPH, HSCI, LAW, NURS, and courses offered by Smith Engineering.

Environmental Chemistry Course Lists

The following lists contain courses offered through other Departments. In accordance with Academic Regulation **2.6** (Access to Classes), students do not have enrolment priority in all of these courses. Access to these courses may only be made available during the Open Enrolment period, and then only if space permits.

ENSC_Interdisciplinary_Humanities

Code	Title	Units
Environmental Science/Studies Interdisciplinary Humanities Options		
CLST 214	Ancient Science	3.00
DEVS 220	Introduction to Indigenous Studies	3.00
DEVS 221	Indigenous Studies II - Resistance and Resurgence	3.00
ENGL 113	Reading for the Planet	3.00
ENGL 218	Introduction to Indigenous Literatures in Canada	3.00
ENGL 276	Literature and the Environment	3.00
PHIL 203	Science and Society	3.00
PHIL 293	Humans and the Natural World	3.00

PHIL 493	Ethics and the Environment	3.00
RELS 235	Religion and Environment	3.00

ENSC_Specialization_Options_A

Code	Title	Units
Options in the Environmental Science Specialization Plans, List A		
BIOL 102	Fundamentals of Biology: Molecular and Cell Biology	3.00
BIOL 103	Fundamentals of Biology: Organisms to Ecosystems	3.00
BIOL 335	Limnology and Aquatic Ecology	3.00
ENSC 301	Environmental Assessment	3.00
ENSC 320	Wildlife Issues in a Changing World	3.00
GPHY 318	Advanced Biogeography	3.00

ENSC_Specialization_Options_B

Code	Title	Units
Options in the Environmental Science Specialization Plans, List B		
BIOL 335	Limnology and Aquatic Ecology	3.00
ENSC 307	Marine Environmental Issues	3.00
ENSC 201	Environmental Toxicology and Chemical Risks	3.00
ENSC 301	Environmental Assessment	3.00
ENSC 320	Wildlife Issues in a Changing World	3.00
ENSC 407	Global Water Resources: Challenges and Opportunities	3.00
ENSC 425	Ecotoxicology	3.00
ENSC 480	Special Topics in Environmental Science	3.00
GEOL 106	Environmental Geology and Natural Hazards	3.00
GEOL 107	History of Life	3.00
GEOL 200	Oceanography	3.00
GPHY 207	Principles of Biogeography	3.00
GPHY 209	Weather and Climate	3.00
GPHY 304	Northern and Arctic Environments	3.00
GPHY 312	Watershed Hydrology	3.00
GPHY 314	Climate Change	3.00
GPHY 317	Soil, Environment, and Society	3.00
GPHY 318	Advanced Biogeography	3.00
GPHY 319	Contemporary Energy Resources	3.00