# ENVIRONMENTAL STUDIES AND SCIENCES (ENV)

Updated January 2, 2024

**Chair: Associate Professor K. Patel;** Professors**:** D. Kumaragamage, J. Tardif, R. Westwood; Associate Professors: R. Bullock, S. Indraratne; Assistant Professor: JP. Desforges; Lab Technician: France Conciatori; Department Assistant: Ayesha Hammad Khan; Adjunct Professor: A. Diduck

**MAJOR REQUIREMENT**

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| Single Major: | Sustainable Environmental Resource Systems, 63 credit hours; Sustainable Urban Environments, 63 credit hours. |
| Double Major: | The student must meet both the requirements of Environmental Studies and Sciences and those of the second Major Department. A course listed by both Department counts towards both Majors (unless it is clearly stated otherwise in that discipline's section of this Calendar). |
| Combined Major: | Minimum 48 credit hours from two (2) different majors with not less than 18 credit hours from each major subject. Required courses depend on second major and will be determined in consultation with the department advisor |

Required courses:

**These are the core courses for all BA students.**

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| **BIOL-1106(3)** | Environmental Biology **OR CHEM-2801(3)** Environmental Issues: A Chemistry Perspective |
| **ECON-1104(3)** | Introduction to Economic Theory |
| **ECON-2317(3)** | Environmental Economics |
| **ENV-1600(3)** | Human-Environmental Interactions |
| **ENV/IDS-2603(3)** | Environmental Sustainability: A Global Dilemma |
| **ENV-2604(3)** | Environment and Health |
| **ENV-3606(3)** | The Environment and Business |
| **ENV-3609(3)** | Research Methods and Design |
| **ENV-3610(3)** | Research Projects |
| **GEOG-1205(3)** | Science for a Dynamic World: An Introduction to Physical Geography |
| **GEOG-2309(3)** | Statistical Techniques in Environmental Analysis |
| **IS-1017(3)** | Introduction to Indigenous Studies: Politics and Governance |
| **PHIL-2233(3)** | Environmental Ethics |

**SUSTAINABLE**

# SUSTAINABLE URBAN ENVIRONMENTS

# CHEMISTRY

# FOREST ECOLOGY

The **Forest Ecology and Forest Policy and Management streams** are accredited by the Canadian Institute of Forestry (CIF) in addition to accreditation by the Canadian Environmental Accreditation Commission (CEAC) and Environmental Careers Organization (ECO) Canada. The Canadian Institute of Forestry is Canada's professional organization of foresters and leading voice for the forest industry. This designation allows graduates from these streams to have the prestige associated with a **nationally recognized forestry baccalaureate program**, giving students a competitive edge 21 (10 Td[T)-3 48y )]TJ-0001 Tc -0.001 Tw [1.200 Td[T)p-31 (gnog0.2

Six credits from among:

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| **IS-1017(3)** | Introduction to Indigenous Studies: Politics and Governance |
| **IS-2050(3)** | Indigenous Peoples, Lands, and Resources |
| **IS-2060(3)** | Indigenous Treaties in Canada |
| **POL-3411(3)** | Indigenous People in Canada and the Law |

Suggested electives:

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| **BIOL/ENV-2477(3)** | Forest Measurement |
| **BIOL/ENV-3473(3)** | Principles of Silviculture+ |
| **CRS-1200(3)** | Introduction to Conflict Resolution Studies |
| **ENV/SOC-2502(3)** | Sociology of the Environment |
| **ENV-3608(3)** | Forest Wildlife Management |
| **ENV-4613(3)** | Directed Research in Environmental Studies and Sciences |
| **ENV-4614 (3)** | Critical Environmental issues |
| **ENV-4615(3)** | Environmental Soil Science |
| **ENV-4617(3)** | Ecology and Management of Species at Risk |
| **GEOG-3306(3)** | Advanced Geographic Information Systems |
| **IS-1017(3)** | Introduction to Indigenous Studies: Politics and Governance |
| **IS-2050(3)** | Indigenous Peoples, Lands, and Resources |
| **IS-2060(3)** | Indigenous Treaties in Canada |
| **IS/POL/UIC -2020(3)** | Colonization and Indigenous Peoples |
| **POL-3405(3)** | Indigenous Politics in Manitoba |
| **POL-3411(3)** | Indigenous People in Canada and the Law |
| **POL-3415(3)** | Indigenous Justice and Canadian Law |
| **REL-2801(3)** | Introduction to Indigenous Spirituality |

* courses with prerequisites that are not required courses in the major
** The field courses are typically held in alternating years in the spring or summer session.
+ Typically held in alternating years in the fall/winter session.

## REQUIREMENTS FOR A 4-YEAR BSC WITH A BUSINESS STREAM

**Students must complete the requirements of the 4-year BSc in Environmental Science in any stream (see previous section) and the set of core courses indicated in the "Science with a Business Stream" section of the Calendar**

## REQUIREMENTS FOR AN HONOURS BSC

**ADMISSION REQUIREMENT** — Students must consult with the Department Advisor in planning their studies.

**GRADUATION REQUIREMENT** — 120 credit hours

Graduation G.P.A. Requirement — To graduate with a BSc Honours, students must have completed the course requirements for a BSc in Environmental Science with a minimum GPA of 3.0 on all Environmental Studies and Sciences courses, which will be calculated on all course attempts in the major. Students must also have a minimum 2.75 GPA on all non-major courses, which will be calculated as for the General Degree (i.e., F's are not included and, in the case of repeated courses, only the highest grade will be used).

**RESIDENCE REQUIREMENT**

Degree: Minimum 60 credit hours

Honours: Minimum 30 credit hours**,** including minimum 18 credit hours at upper level (3000/4000) of which a minimum of 9 credit hours at 4000 level

**GENERAL DEGREE REQUIREMENT**

Humanities: 12 credit hours in Humanities

Science: 6 credit hours

Writing: Minimum 3 credit hours of Academic Writing. RHET-1106 Academic Writing: Links with the Disciplines, Environmental Studies, is recommended.

**The Department recommends that students take RHET-1106 early in their first year of studies as most courses in DESS programs include multiple writing assignments.**

Indigenous: 3 credit hours in designated Indigenous requirement courses

Maximum Introductory Courses: Students may use a maximum of 42 credit hours at the 1000 level. Of these, a maximum of 6 credit hours may be below the 1000 level. As a result, students must take a minimum of 78 credit hours at the 2000-level or above in order to not exceed the maximum number of introductory courses.

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| Distribution: | Minimum three (3) credit hours from each of five (5) different subjects. |
| 4000-level Courses: | |

CHEM-1111(3) Introduction to the Chemical Properties of Matter
CHEM-1112(3) Basic Principles of Chemical Reactivity
Academic Writing Requirement: 3 credit hours Humanities

**MAJOR REQUIREMENT:**

**Year 1 - University of Winnipeg**

**BIOL-1115(3)** Cells and Cellular Processes
**BIOL-1116(3)** Evolution, Ecology and Biodiversity
**CHEM-1111(3)** Introduction to the Chemical Properties of Matter
**CHEM-1112(3)** Basic Principles of Chemical Reactivity
**ECON-1104(3**) Introduction to Economic Theory
**ENV-1600(3)** Human-Environmental Interaction
**GEOG-1205(3)** Our Dynamic World: An Introduction to Physical Geography
**Academic Writing Requirement**

**3 credit hours Humanities**

**Year 2 - University of Winnipeg**

**BIOL-2403(3)** Principles of Ecology
**CHEM-2302(3)** Quantitative Chemical Analysis
**CHEM-3302(3)** Methods of Chemical Analysis
**ECON-2317(3)** Environmental Economics
**ENV/IDS-2603(3)** Environmental Sustainability: A Global Dilemma
**ENV-3035(3)** Law and the Environment
**PHIL-2233(3)** Environmental Ethics
**3 credit hours Humanities**
**3 credit hours from among:**
**GEOG-2309(3)** Statistical Techniques in Environmental Analysis
**STAT-1301(3)** Statistical Analysis 1
**STAT-1501(3)** Elementary Biological Statistics I
**3 credit hours from among:**
**BIOL-3492(3)** Quantitative and Theoretical Biology
**CHEM-2701(3)** Introduction to Computers in Chemistry
**ACS-1453(3)** Introduction to Computers

**Year 3 -** RRC Polytech

**CIVC-1044** Project Administration
**CIVL-2001** Calculus and Statistics
**CIVL-2006** Geo-Environmental Fundamentals
**CIVL-2009** Fundamentals of GIS
**CIVL-2012** Environmental Analysis
**CIVL-2020** Environmental Science
**CIVL-2031** Chemistry 2
**CIVL-2032** Health and Safety
**CIVW-2008** Co-op Work Placement

**Year 4 -** RRC Polytech

**CIVL-2007** Environmental Management
**CIVL-3005** Applied Research Project
**CIVL-3007** Waste Management
**CIVL-3008** Water and Waste Water
**CIVL-3011** Remote Sensing and Digital Photogrammetry
**CIVL-3016** Hydrology
**CIVL-3026** Engineering Economics
**CIVL-3027** Supervisory Management

**Year 5 - University of Winnipeg**

**ENV-3609(3)** Research Methods and Design
**ENV-3610(3)** Research Projects
**ENV-4611(3)** Environmental Impact Assessment
**3 credit hours Humanities**
**18 credit hours from among:**
**BIOL-2902(3)** Biology of Bacteria and Archaea (formerly “Biology of the Prokaryotes and Viruses”)
**BIOL-3410(3)** Freshwater Ecology
**BIOL/ENV-3471(3)** Forest Ecology
**BIOL/ENV-3476(3)** Forest Policy and Management
**BIOL-3901(3)** Microorganisms and Disease
**BIOL-3902(3)** Microbial Ecology
**BIOL-4471(3)** Ecological Methodology
**CHEM-3601(3)** Environmental Chemistry
**ENV-3607(3)** Forests and the Environment
**ENV-4614(3)** Critical Environmental Issues