

# ENVIRONMENTAL STUDIES AND SCIENCES (ENV)

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## DEGREES/PROGRAMS OFFERED

3-Year BA

4-Year BA

4-Year Honours BA

4-Year BSc

4-Year BSc (Business stream)

4- Year Honours BSc

5-Year Joint Program in Applied Environmental Science (UW/RRC Polytech)

Master of Environment and Social Change – Please see the *Graduate Studies Academic Calendar*.

## INTRODUCTION

The original Environmental Studies Program was founded in 1970 as one of the first interdisciplinary undergraduate environment programs in Canada, and one of the first few to emerge worldwide. During the last five decades the activities and the functions of the program have grown substantially with seven degree options available to students.

Following the principles of sustainability, the Department of Environmental Studies and Sciences takes an integrated and practical approach to human-environmental interactions and resource and environmental problems. The mission of the Department is to maintain and restore the health of the ecosphere and its people by i) educating and training the environmental leaders of tomorrow, ii) creating and disseminating knowledge, and iii) engaging with communities at local, regional and global levels.

The Department of Environmental Studies and Sciences (DESS) offers various degree options, noted above. BA students can take either the Sustainable Environmental Resource Systems stream or the Sustainable Urban Environments stream. BSc students can choose from among four streams: Chemistry, Forest Policy and Management, Forest Ecology and Global Environmental Systems. Students also have the opportunity to add on a Business Stream (see the “Science with a Business Stream” section of this Academic Calendar). The joint applied program with RRC Polytech is a 5-year program that includes a full co-operative education work term and students receive both a diploma and a degree.

## NATIONAL ENVIRONMENTAL PROGRAM ACCREDITATION FOR BA DEGREES

The BA degrees in Environmental Studies at The University of Winnipeg were among the first of their kind in Canada to be accredited by the Canadian Environmental Accreditation Commission (CEAC) and Environmental Careers Organization (ECO) Canada. This accreditation demonstrates to students, parents, educators and industry that our BA Degrees meet a national standard of quality.

## REQUIREMENTS FOR A 3-YEAR BA

<b>ADMISSION REQUIREMENT</b>	Students must meet prerequisites where required.
<b>GRADUATION REQUIREMENT</b>	90 credit hours
<b>RESIDENCE REQUIREMENT</b>	
Degree:	Minimum 30 credit hours
Major:	Minimum 18 credit hours
<b>GENERAL DEGREE REQUIREMENT</b>	
Humanities:	12 credit hours in Humanities
Science:	6 credit hours in Science
Writing:	Minimum 3 credit hours of Academic Writing. RHET-1102 Academic Writing: Links with the Disciplines, Environmental Studies is recommended.
	<b>The Department recommends that students take RHET-1102 early in their first year of studies as most DESS courses include multiple writing assignments.</b>
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 48 credit hours at the 2000-level or above in order to not exceed the maximum number of introductory courses.
Distribution:	Minimum three (3) credit hours from each of five (5) different subjects.

## MAJOR REQUIREMENT

- 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.**

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

## SUSTAINABLE ENVIRONMENTAL RESOURCE SYSTEMS

Required courses:

**Core courses for all BA students PLUS**

<b>ENV-3035(3)</b>	Law and the Environment <b>OR</b> <b>ENV-3602(3)</b> Environmental Governance for Sustainability
<b>ENV/UIC-3025(3)</b>	Issues in Sustainable Cities <b>OR</b> <b>ENV/UIC-3603(3)</b> Winnipeg and the Environment: A Case Study Approach
<b>ENV-3612(3)</b>	Environmental Impacts of Agriculture
<b>ENV/BIOL-3476(3)</b>	Forest Policy and Management
<b>GEOG-2419(3)</b>	Resource Development and the Canadian Environment
<b>Plus:</b> Nine credits from the Sustainable Environmental Resource Systems suggested electives list.	

**Sustainable Environmental Resource Systems suggested electives:**

<b>CRS-1200(6)</b>	Introduction to Conflict Resolution Studies
<b>ECON-2318(3)</b>	Energy Economics
<b>ENV/SOC-2502(3)</b>	Sociology of the Environment
<b>ENV/GEOG/WGS-2416(3)</b>	Sex, Gender, Space and Place
<b>ENV/IDS-2521(3)</b>	Voluntary Simplicity
<b>ENV-4616(3)</b>	Campus Sustainability
<b>GEOG-2304(3)</b>	Computer Mapping
<b>GEOG-2306(3)</b>	Introduction to Geographic Information Systems
<b>GEOG-2401(3)</b>	Agricultural Geography
<b>GEOG-2212(3)</b>	Natural Hazards
<b>GEOG-3216(3)</b>	Arctic Environments
<b>GEOG-3218(3)</b>	Global Biogeochemical Cycles
<b>IDS-1100(6)</b>	Introduction to International Development Studies
<b>IS-1016(3)</b>	Introduction to Indigenous Studies: Art, Culture and History
<b>IS-2050(3)</b>	Indigenous Peoples, Lands, and Resources
<b>IS-2060(3)</b>	Indigenous Treaties in Canada
<b>POL-2100(6)</b>	Global Politics
<b>POL-2300(6)</b>	Public Administration
<b>POL-3105(3)</b>	Global Political Economy
<b>POL-3411(3)</b>	Indigenous People in Canada and the Law
<b>POL-3450(3)</b>	Sustainability and Environmental Politics

Note: These electives also apply to the 4-year degree for this stream.

## SUSTAINABLE URBAN ENVIRONMENTS

Required courses:

**Core courses for all BA students PLUS**

<b>ENV-3035(3)</b>	Law and the Environment <b>OR</b> <b>ENV-3602(3)</b> Environmental Governance for Sustainability
<b>ENV/UIC-3025(3)</b>	Issues in Sustainable Cities

**ENV/UIC-3603(3)** Winnipeg and the Environment: A Case Study Approach  
**GEOG-2414(3)** The Urban Environment  
**GEOG-2415(3)** An Introduction to Urban Development  
**Plus:** Nine credits from the Sustainable Urban Environments suggested electives list.

**Sustainable Urban Environments suggested electives:**

**ENV/SOC-2502(3)** Sociology of the Environment  
**ENV/GEOG/WGS-2416(3)** Sex, Gender, Space and Place  
**ENV/IDS-2521(3)** Voluntary Simplicity  
**GEOG-2304(3)** Computer Mapping  
**GEOG-2306(3)** Introduction to Geographic Information Systems  
**GEOG-3402(3)** Urbanization in the Developing World  
**GEOG-3413(3)** Urban Revitalization: Rebuilding of Decaying Cities  
**GEOG-4403(3)** Urban Land Use – Developmental Processes  
**GEOG-4404(3)** Field Research in Urban Geography  
**HIST-3544(6)** The History of Winnipeg  
**IS-1016(3)** Introduction to Indigenous Studies: Art, Culture and History  
**POL-2300(6)** Public Administration  
**POL-2500(3)** City Politics  
**POL-2505(3)** Issues in City Politics  
**UIC-2001/IS-2301(3)** Community Development  
**UIC 2220(3)** Urban Poverty and Policy  
**UIC/WGS-3020(3)** Women and the Inner City  
**UIC-3030/GEOG-3432(3)** Urban and Community Planning  
**UIC-3050(3)** Immigration and the Inner City  
**UIC-3060(3)** Confronting Racism in the Inner City  
 Note: These electives also apply to the 4-year degree for this stream.

## REQUIREMENTS FOR A 4-YEAR BA

<b>ADMISSION REQUIREMENT</b>	Students must meet prerequisites where required.
<b>GRADUATION REQUIREMENT</b>	120 credit hours
<b>RESIDENCE REQUIREMENT</b>	
Degree:	Minimum 60 credit hours
Major:	Minimum 30 credit hours
<b>GENERAL DEGREE REQUIREMENT</b>	
Humanities:	12 credit hours
Science:	6 credit hours
Social Science:	12 credit hours
Writing:	Minimum 3 credit hours of Academic Writing. RHET-1102 Academic Writing: Links with the Disciplines, Environmental Studies, is recommended.
	<b>The Department recommends that students take RHET-1102 early in their first year of studies as most courses in DESS programs include multiple writing assignments.</b>
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.
Distribution:	Minimum three (3) credit hours from each of five (5) different subjects.
4000-Level Courses:	Minimum 3.0 GPA (B) in major courses or permission of the department (students lacking the requisite 3.0 GPA should consult the department concerned regarding eligibility to take 4000-level courses).
<b>MAJOR REQUIREMENT</b>	
Single Major:	Sustainable Environmental Resource Systems, 81 credit hours; Sustainable Urban Environments, 81 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 Departments counts towards both Majors (unless it is clearly stated otherwise in that discipline's section of the Calendar).
Combined Major:	Minimum 60 credit hours from two (2) different majors with not less than 24 credit hours from each major subject. Required courses depend on second major and will be determined in consultation with the departmental advisor.

## SUSTAINABLE ENVIRONMENTAL RESOURCE SYSTEMS

Required courses:

**Required courses for all 3-year BA Sustainable Environmental Resource Systems students PLUS**

<b>ENV-3035(3)</b>	Law and the Environment
<b>ENV-3602(3)</b>	Environmental Governance for Sustainability
<b>ENV-4611(3)</b>	Environmental Impact Assessment
<b>ENV-4614(3)</b>	Critical Environmental Issues
<b>ENV-4617(3)</b>	Ecology and Management of Species at Risk

**Plus:** Six credits from the Sustainable Environmental Resource Systems suggested electives list.

Note: See the electives list in the 3-year degree for this stream.

## SUSTAINABLE URBAN ENVIRONMENTS

Required courses:

**Required courses for all 3-year BA Sustainable Urban Environments students PLUS**

<b>ENV-3035(3)</b>	Law and the Environment
<b>ENV-3602(3)</b>	Environmental Governance for Sustainability
<b>ENV-4611(3)</b>	Environmental Impact Assessment
<b>ENV-4614(3)</b>	Critical Environmental Issues
<b>ENV-4616(3)</b>	Campus Sustainability

**Plus:** Six credits from the Sustainable Urban Environments suggested electives list.

Note: See the electives list in the 3-year degree for this stream.

## REQUIREMENTS FOR AN HONOURS BA

### ADMISSION REQUIREMENT

Students must consult with the Department Thesis Course Advisor in planning their studies.

### GRADUATION REQUIREMENT

Graduation G.P.A. Requirement

120 credit hours

To graduate with a BA Honours, students must have completed the course requirements for a BA in Environmental Studies 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-1102 Academic Writing: Links with the Disciplines, Environmental Studies, is recommended.

**The Department recommends that students take RHET-1102 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.

Distribution:

Minimum three (3) credit hours from each of five (5) different subjects.

4000-level Courses:

Minimum 3.0 GPA (B) in major courses or permission of the department (students lacking the requisite 3.0 GPA should consult the department concerned regarding eligibility to take 4000-level courses).

### HONOURS REQUIREMENT

Single Honours:

Minimum requirements for a 4 year BA degree in Environmental Studies in either of the following streams: Sustainable Environmental Resource Systems or Sustainable Urban Environments. Minimum 30 credit hours in upper-level (3000 and 4000) courses of which a minimum of 12 credit hours must be at the 4000 level.

Required Courses:

<b>GEOG-2309(3)</b>	Statistical Techniques in Environmental Analysis
<b>ENV-4611(3)</b>	Environmental Impact Assessment
<b>ENV-4701(6)</b>	Environmental Studies Honours Thesis

## NATIONAL ENVIRONMENTAL PROGRAM ACCREDITATION FOR BSc DEGREES

The BSc degrees in Environmental Science at The University of Winnipeg have been accredited by the Canadian Environmental Accreditation Commission (CEAC) and Environmental Careers Organization (ECO) Canada. This accreditation demonstrates to students, parents, educators and industry that our BSc Degrees in Environmental Science meet a national standard of quality.

### REQUIREMENTS FOR A 4-YEAR BSc

**ADMISSION REQUIREMENT** Students must meet prerequisites where required.

**GRADUATION REQUIREMENT** 120 credit hours

#### RESIDENCE REQUIREMENT

Degree: Minimum 60 credit hours  
Major: Minimum 30 credit hours

#### GENERAL DEGREE REQUIREMENT

Humanities: 12 credit hours  
Science: 6 credit hours  
Writing: Minimum 3 credit hours of Academic Writing. RHET-1103 Academic Writing: Links with the Disciplines, Environmental Studies, is recommended.

**The Department recommends that students take RHET-1103 early in their first year of studies as most DESS courses 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.

Distribution: Minimum three (3) credit hours from each of five (5) different subjects.

#### MAJOR REQUIREMENT

Single Major: Chemistry, 78 credit hours; Global Environmental Systems, 84 credit hours; Forest Ecology, 84 credit hours; Forest Policy and Management, 78 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 Departments counts towards both Majors (unless it is clearly stated otherwise in that discipline's section of the Calendar).  
Combined Major: Minimum 60 credit hours from two (2) different majors with not less than 24 credit hours from each major subject. Required courses depend on second major and will be determined in consultation with the departmental advisor.

Required courses:

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

**BIOL-1115(3)** Cells and Cellular Processes  
**BIOL-1116(3)** Evolution, Ecology and Biodiversity  
**BIOL-2403(3)** Principles of Ecology  
**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 Interactions  
**ENV-3035(3)** Law and the Environment  
**ENV-4611(3)** Environmental Impact Assessment  
**GEOG-1205(3)** Our Dynamic World: An Introduction to Physical Geography  
**PHIL-2233(3)** Environmental Ethics

3 credit hours from among:

**GEOG-2309(3)** Statistical Techniques in Environmental Analysis  
**STAT-1301(3)** Statistical Analysis I  
**STAT-1501(3)** Elementary Biological Statistics I

## CHEMISTRY

Required courses:

### Core courses for all BSc students PLUS

<b>BIOL-3410(3)</b>	Freshwater Ecology
<b>CHEM-2102(3)</b>	Thermodynamics and Kinetics
<b>CHEM-2202(3)</b>	Organic Chemistry I
<b>CHEM-2203(3)</b>	Organic Chemistry II
<b>CHEM-2302(3)</b>	Quantitative Chemical Analysis
<b>CHEM-2401(3)</b>	Inorganic Chemistry I
<b>CHEM-2501(3)</b>	Principles of Biochemistry or <b>CHEM-3502(3)</b> Intermediate Biochemistry I or <b>ENV/CHEM-3611(3)</b> Environmental Toxicology
<b>CHEM-3302(3)</b>	Methods of Chemical Analysis
<b>CHEM-3601(3)</b>	Environmental Chemistry
<b>ENV/IDS-2603(3)</b>	Environmental Sustainability: A Global Dilemma
<b>MATH-1101(6)</b>	Introduction to Calculus or the equivalent <b>MATH-1103(3)</b> Introduction to Calculus I and <b>MATH-1104(3)</b> Introduction to Calculus II
<b>PHYS-1101(6)</b>	Foundations of Physics I or <b>PHYS-1301(6)</b> Introduction to Physics

## GLOBAL ENVIRONMENTAL SYSTEMS

Required courses:

### Core courses for all BSc students PLUS

<b>BIOL-3410(3)</b>	Freshwater Ecology
<b>ENV/IDS-2603(3)</b>	Environmental Sustainability: A Global Dilemma
<b>ENV 2604(3)</b>	Environment and Health
<b>ENV 3602(3)</b>	Environmental Governance for Sustainability
<b>ENV-4615(3)</b>	Environmental Soil Science
<b>GEOG-2207(3)</b>	Climatology
<b>GEOG-2213(3)</b>	Introductory Soil Science
<b>GEOG-3210(3)</b>	Hydrology

6 credit hours from among the following ecology and geography options:

<b>ENV-3607(3)</b>	Forests and the Environment
<b>ENV-4617(3)</b>	Ecology and Management of Species at Risk
<b>GEOG-2212(3)</b>	Natural Hazards
<b>GEOG-2214(3)</b>	Soil-Vegetation Systems
<b>GEOG-3216(3)</b>	Arctic Environments
<b>GEOG-3217(3)</b>	Tropical Environments
<b>GEOG-3408(3)</b>	Water Resources *

6 credit hours from the following research methods and land management techniques options:

<b>ENV-3609(3)</b>	Research Methods and Design
<b>GEOG-2304(3)</b>	Computer Mapping
<b>GEOG-2306(3)</b>	Introduction to Geographic Information Systems
<b>GEOG-2316(3)</b>	Introduction to Remote Sensing
<b>GEOG-3319(3)</b>	Advanced Remote Sensing

6 credit hours from the following environmental management and physical geography options:

<b>ENV-3606(3)</b>	The Environment and Business
<b>ENV-3608(3)</b>	Forest Wildlife Management
<b>ENV-3612(3)</b>	Environmental Impacts of Agriculture
<b>GEOG-2215(3)</b>	Mineralogy and Petrology
<b>GEOG-2218(3)</b>	Fluvial and Hillslope Processes
<b>GEOG-3204(3)</b>	Climate Change and Variability

6 credit hours from the following social science options:

<b>CRS-1200(6)</b>	Introduction to Conflict Resolution Studies
<b>ENV/SOC-2502(3)</b>	Sociology of the Environment
<b>ENV/WGS-3004(3)</b>	Women, Health and the Environment
<b>GEOG-2408(3)</b>	Environmental Perception and Human Behaviour *
<b>GEOG-2414(3)</b>	The Urban Environment *
<b>GEOG-2431(3)</b>	Population Geography *
<b>IDS-1100(6)</b>	Introduction to International Development Studies
<b>IDS/ANTH-3160(3)</b>	Cultural Perspectives on Global Processes *

\*courses with prerequisites that are not required courses in the major

## 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 and the specialized skills needed to work in the forest industry or many associated professions. **Graduates of the University of Winnipeg's Forestry programs receive Silver Ring recognition from the CIF** which symbolizes their responsibility to manage the forest for future generations and is a commitment to life-long learning and worn with pride. The Silver Rings are presented at a special ceremony with representatives of the CIF and the University of Winnipeg. The Silver Rings recognize that students are educated and trained in the complex interrelationships of forest ecosystems, water, fish and wildlife, as well as the social, cultural and economic aspects of forestry.

Required courses:

**Core courses for all BSc students (except that GEOG-2309(3) Statistical Techniques in Environmental Analysis is required) PLUS**

<b>BIOL-2153(3)</b>	Biology of Vascular Plants
<b>BIOL/ENV-2401(1)</b>	Forest Field Skills Camp **
<b>BIOL-2477(3)</b>	Forest Measurement +
<b>BIOL-3152(3)</b>	Flora of Manitoba
<b>BIOL-3471(3)</b>	Forest Ecology+
<b>BIOL-3473(3)</b>	Principles of Silviculture +
<b>BIOL/ENV-3476(3)</b>	Forest Policy and Management
<b>BIOL-4451(2)</b>	Forest Ecosystems Field Course **
<b>BIOL-4471(3)</b>	Ecological Methodology+
<b>BIOL-4473(3)</b>	Dendrochronology +
<b>BIOL-4474(3)</b>	Forest Health and Protection +
<b>BIOL-4475(3)</b>	Urban Forestry +
<b>ENV-3607(3)</b>	Forests and the Environment +
<b>ENV-3608(3)</b>	Forest Wildlife Management +
<b>GEOG-2213(3)</b>	Introductory Soil Science
<b>GEOG-2306(3)</b>	Introduction to Geographic Information Systems *
<b>GEOG-2316(3)</b>	Introduction to Remote Sensing

Suggested electives:

<b>BIOL-2115(3)</b>	Biology of Invertebrates
<b>BIOL-3410(3)</b>	Freshwater Ecology
<b>BIOL-3801(3)</b>	General Entomology*
<b>ENV-4613(3)</b>	Directed Research in Environmental Studies and Sciences
<b>ENV-4614 (3)</b>	Critical Environmental issues
<b>ENV-4615(3)</b>	Environmental Soil Science
<b>ENV-4617(3)</b>	Ecology and Management of Species at Risk
<b>GEOG-2207(3)</b>	Climatology
<b>GEOG-2304(3)</b>	Computer Mapping
<b>GEOG-3210(3)</b>	Hydrology
<b>GEOG-3218(3)</b>	Global Biogeochemical Cycles
<b>GEOG-3306(3)</b>	Advanced Geographic Information Systems
<b>GEOG-3319(3)</b>	Advanced Remote Sensing

\* 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.

## FOREST POLICY AND MANAGEMENT

Required courses:

**Core courses for all BSc students (except that GEOG-2309(3) Statistical Techniques in Environmental Analysis is required) PLUS**

<b>BIOL-2153(3)</b>	Biology of Vascular Plants
<b>BIOL/ENV-2401(1)</b>	Forest Field Skills Camp **
<b>BIOL-3471(3)</b>	Forest Ecology+
<b>BIOL/ENV-3476(3)</b>	Forest Policy and Management
<b>BIOL-4451(2)</b>	Forest Ecosystems Field Course **
<b>BIOL-4474(3)</b>	Forest Health and Protection
<b>BIOL-4475(3)</b>	Urban Forestry
<b>ECON-2317(3)</b>	Environmental Economics
<b>ENV/IDS-2603(3)</b>	Environmental Sustainability: A Global Dilemma
<b>ENV-3602(3)</b>	Environmental Governance for Sustainability
<b>ENV-3606(3)</b>	The Environment and Business
<b>ENV-3607(3)</b>	Forests and the Environment
<b>GEOG-2306(3)</b>	Introduction to Geographic Information Systems

Six credits from among:

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

Suggested electives:

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

Graduation G.P.A. Requirement

120 credit hours

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-1103 Academic Writing: Links with the Disciplines, Environmental Studies, is recommended.

**The Department recommends that students take RHET-1103 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.



Distribution: Minimum three (3) credit hours from each of five (5) different subjects.  
4000-level Courses: Minimum 3.0 GPA (B) in major courses or permission of the department (students lacking the requisite 3.0 GPA should consult the department concerned regarding eligibility to take 4000-level courses).

## HONOURS REQUIREMENT

Single Honours:

Minimum requirements for a BSc degree in Environmental Science in any of the following streams: Forest Ecology, Forest Policy and Management, Global Environmental Systems and Chemistry.

Note: **GEOG-2309(3)** Statistical Techniques in Environmental Analysis must be chosen for the statistics requirement.

Minimum 30 credit hours in upper-level (3000 and 4000) courses of which a minimum of 12 credit hours must be at the 4000 level.

Additional Required Course:

**ENV-4701(6)** Honours Environmental Studies and Sciences Thesis

# THE UNIVERSITY OF WINNIPEG / RRC POLYTECH 5-YEAR JOINT PROGRAM IN APPLIED ENVIRONMENTAL SCIENCE - REQUIREMENTS

This is a joint degree program whereby students are required to take courses at both The University of Winnipeg and RRC Polytech in a recommended sequence. The program has been specifically designed to prepare students for careers in industry where practical and theoretical skills are necessary.

In the **5-year program**, students are enrolled at The University of Winnipeg in years one, two and five, and at RRC Polytech for years three and four. The 5-year structure includes the benefit of a full co-op work term. (The work term credit requires that the student complete a minimum of 16 weeks of full-time, paid work experience related to their training and complete a reflective journal of their work experience.). The 5-year structure will increase future opportunities for students because they will also be eligible for certification by the Certified Technicians and Technologists Association of Manitoba. Students who successfully complete the entire program will receive a joint 5-Year BSc degree parchment from The University of Winnipeg and an Environmental Engineering Technology Diploma from RRC Polytech.

**Note:** Transfer of courses between institutions applies only to students who are officially registered in the joint program. The RRC Polytech courses require a laptop computer and this incurred cost is the responsibility of the student. Students must inform the Departmental Chair prior to filing their application to enroll in the RRC Polytech component of the program. Students must activate their registration when returning for their last year of the program at the University of Winnipeg.

## ADMISSION REQUIREMENT

Students must meet the entrance requirements for admission to The University of Winnipeg. **Application to the program in Applied Environmental Science at RRC Polytech must be completed through the Admissions Office of The University of Winnipeg by March 1<sup>st</sup> of each year in order to enter the program in September of the same year.**

## GRADUATION REQUIREMENT

120 credit hours

## RESIDENCE REQUIREMENT

Degree:

Minimum 60 credit hours

Major:

Minimum 30 credit hours

## GENERAL DEGREE REQUIREMENT

Humanities:

12 credit hours in Humanities

Science:

6 credit hours

Writing:

Minimum 3 credit hours of Academic Writing. RH-1103 Academic Writing: Links with the Disciplines, Environmental Studies, is recommended.

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.

**The Department recommends that students take RHET-1103 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

Distribution:

Minimum three (3) credit hours from each of five (5) different subjects.

University of Winnipeg minimum pre-requisites for entering RRC component of the 5 Year program:

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-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

<b>ENV 4615(3)</b>	Environmental Soil Science
<b>GEOG-2213(3)</b>	Introductory Soil Science
<b>GEOG-2214(3)</b>	Soil-Vegetation Systems
<b>GEOG-2414(3)</b>	The Urban Environment
<b>GEOG-3408(3)</b>	Water Resources

## **COURSE DESCRIPTIONS**

All course descriptions for all undergraduate programs can now be found in one large PDF called "All course descriptions" in the "Academic Calendar" section of the University website:  
<http://uwinnipeg.ca/academics/calendar/index.html>