

ENVIRONMENTAL STUDIES AND SCIENCES (ENV)

Updated January 31,2025

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

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 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

ADMISSION REQUIREMENT	Students must meet prerequisites where required.
GRADUATION REQUIREMENT	90 credit hours
RESIDENCE REQUIREMENT	
Degree:	Minimum 30 credit hours
Major:	Minimum 18 credit hours
GENERAL DEGREE REQUIREMENT	
Humanities:	12 credit hours in Humanities
Science:	6 credit hours in Science
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 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 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.

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 ENVIRONMENTAL RESOURCE SYSTEMS

Required courses:

Core courses for all BA students PLUS

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

Sustainable Environmental Resource Systems suggested electives:

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

- ENV-3035(3)** Law and the Environment **OR ENV-3602(3)** Environmental Governance for Sustainability
ENV/UIC-3025(3) 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) Introduction to Cartography
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 and Oppression

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

REQUIREMENTS FOR A 4-YEAR BA

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
Social Science:	12 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.
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).
MAJOR REQUIREMENT	
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

ENV-3035(3)	Law and the Environment
ENV-3602(3)	Environmental Governance for Sustainability
ENV-4611(3)	Environmental Impact Assessment
ENV-4614(3)	Critical Environmental Issues
ENV-4617(3)	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

ENV-3035(3)	Law and the Environment
ENV-3602(3)	Environmental Governance for Sustainability
ENV-4611(3)	Environmental Impact Assessment
ENV-4614(3)	Critical Environmental Issues
ENV-4616(3)	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: Honours:	Minimum 60 credit hours 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: Science: Writing:	12 credit hours in Humanities 6 credit hours 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.
Distribution: 4000-level Courses:	Minimum three (3) credit hours from each of five (5) different subjects. 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:

GEOG-2309(3)
ENV-4611(3)
ENV-4701(6)

Statistical Techniques in Environmental Analysis
Environmental Impact Assessment
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-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 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) Science for a 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

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

GLOBAL ENVIRONMENTAL SYSTEMS

Required courses:

Core courses for all BSc students PLUS

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

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

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

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

ENV-3609(3)	Research Methods and Design
GEOG-2304(3)	Introduction to Cartography
GEOG-2306(3)	Introduction to Geographic Information Systems
GEOG-2316(3)	Introduction to Remote Sensing
GEOG-3319(3)	Advanced Remote Sensing

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

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

6 credit hours from the following social science options:

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

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

Suggested electives:

BIOL-2115(3)	Biology of Invertebrates
BIOL-3410(3)	Freshwater Ecology
BIOL-3801(3)	General Entomology*
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-2207(3)	Climatology
GEOG-2304(3)	Introduction to Cartography
GEOG-3210(3)	Hydrology
GEOG-3218(3)	Global Biogeochemical Cycles
GEOG-3306(3)	Advanced Geographic Information Systems
GEOG-3319(3)	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

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

Six credits from among:

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:

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

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-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.

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 1st 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-1106 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-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

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/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

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