University of Manitoba | Clayton H. Riddell Faculty of Environment, Earth, and Resources

2025-2026

FOCUS AREA

Environmental Studies
Environmental Science

June 2025

Environmental Studies and Environmental Science

The Environmental Studies and Environmental Science programs are designed to fill a need for quality, interdisciplinary undergraduate education. Several government and industry studies have identified the need for qualified experts with training that is holistic, multi-disciplinary with a 'big picture' approach of how their expertise can be used in conjunction with other specialists to solve practical environmental problems.

Undergraduate students in either program receive both a solid scientific background complimented by a core of environmental information and have the opportunity to specialize in one of a diverse range of focus areas. You will gain access to some excellent and unique resources. Among these are field courses on ecological and environmental topics, linkage with the Centre for Earth Observation Science, exposure to the work of the federal government's Freshwater Institute researchers, including nearby ecosystem research at the Experimental Lake Area.

Making the Most of It!

First Year

- Become knowledgeable about programs of interest and requirements
- Meet with an advisor at least once a term

Second Year

- Explore your academic and career interests
- Research courses
- Explore connections between your interests, strengths and potential careers
- Consider the Co-op Option
- Consider the Honours program

Third Year

- Network with people who work in your field of interest
- Identify education and/or additional skills you will need to attain employment or training in your field
- Be able to articulate what you are studying and why

Fourth Year

- Make decisions - it's a lifelong skill!
- Research employment or graduate school options
- Understand the skills employers or grad schools seek

What is a Focus Area?

A focus area is an individualized approach to undergraduate education. The student, in collaboration with a student advisor, will organize a body of courses from several subject fields around a central theme, topic, or set of related issues. The approach and coursework draw on different subjects, enabling a truly multi-disciplinary education to be obtained. The focus area must articulate a coherent field of study and provide a theoretical context for the focal issues.

How do I decide on a Focus Area?

Through student driven research and by identifying areas and careers that you are interested in, you will be able to develop a focus area to acquire the knowledge and skills required to enter further research programs and the workforce.

You should begin thinking about your focus area during your second year. Use some of the activities and information outlined in this brochure to narrow down your interests. From here, you can begin to characterize and develop the content that will make up your focus area.

Key Activities

- Brainstorm, brainstorm, brainstorm
- Use the outline tools provided through websites like Environmental Careers Organization www.eco.ca
- Visit the Career Resource Centre and take advantage of the many services they offer
- Make a list of courses you would like to take in the future
- Talk to your student advisor, cooperative education coordinator, instructors, classmates, employers, family and alumni

By performing these activities, you should be able to make a list of important skills required in your chosen field.

FOCUS AREAS

Students must complete a minimum of 9 credit hours in the General program, and 33 credit hours (to include at least 21 credit hours at the 3000/4000 level) in the Major and Honours programs in one of the following focus areas:

- Conservation & Biodiversity
- Environmental Assessment
- Environmental Health
- Land Systems
- Natural Resource Management
- Northern Studies
- Policy & Law
- Stewardship
- Sustainable Building
- Sustainable Development
- Toxicology
- Water Resources
- Wildlife Management

Courses Applicable to All Focus Areas

ENVR 2030	Introduction to Sustainability *(may not be held with ENVR 2020 (T) when titled as Introduction to Sustainability)*
ENVR 3020 (T)	Application in Field Readiness *(when titled) (Department Head Approval)*
ENVR 3350	Environmental Management Systems *(Department Head Approval)*
ENVR 4000 (T)	Data Science with R for Environmental Research *(when titled) (Department Head Approval and 60 credit hours)*
ENVR 4000 (T)	Decision Making for Sustainability *(when titled) (Department Head Approval and 60 credit hours)*
ENVR 4000 (T)	Field Course in Arctic Coastal Oceanography *(when titled) (Department Head Approval and 60 credit hours; also offered as GEOG 4670)*
ENVR 4000 (T)	Programming for Environmental Science Data Analysis *(when titled) (Department Head Approval and 60 credit hours)*
ENVR 4000 (T)	Project Management for Environmental Practitioners *(when titled) (Department Head Approval and 60 credit hours)*
GEOG 3200	Introduction to Remote Sensing *(GEOG 1290, and one of PHYS 1020 or MATH 1500)*
GEOG 3390	Introduction to Climate Change and its Causes *(3 credit hours from GEOG or ENVR)*
GEOG 3730	Geographic Information Systems *(3 credit hours from GEOG, GEOL or ENVR at the 1000 or 2000 level)*
GEOG 4390	Global Climate Change *(GEOG 3390)*
GEOG 4670 (T)	Field Course in Arctic Coastal Oceanography *(when titled) (Department Head Approval; also offered as ENVR 4000)*
INDG 3310	Canadian Law and Indigenous Peoples *([INDG 1200 (or the former NATV 1200)] or [INDG 1220 (or the former NATV 1220) and INDG 1240 (or the former NATV 1240)] or written consent of instructor)*

Meet with an Academic Advisor

Prior to registration for the Fall and Winter term, you are encouraged to meet with an Academic Advisor to discuss your course selection. Advisors are available on a drop-in basis from 9am-4pm, Monday through Friday in the Riddell Dean's Office, 440 Wallace Building, by e-mail: Riddell.Advisor@umanitoba.ca or schedule an appointment: Book a Meeting with the Academic Advisor.

Registration Holds

Remember, not all registration holds are from academic departments. Some holds may be the result of past due balances, outstanding library fees, parking fees, or other administrative fees. You can always check your holds on Aurora under "View Holds".

Prerequisites

Be sure you have the necessary pre-requisites before you try to register for a course. Prerequisites are in place to assist students to academically succeed. If you feel you have grounds for a professor to waive a prerequisite, you may start by emailing the prof and asking for a prerequisite waiver.

Prerequisite waiver e-mails from the professor should be forwarded to Riddell.Advisor@umanitoba.ca so that an Academic Advisor can load the permission.

Prerequisites are listed in brackets after courses in this brochure. Unless otherwise noted, a minimum grade of 'C' is required in a prerequisite course.

Department Head Approval

Why do some courses require 'department head approval' and how do I get it? Start by emailing the professor of the course and ask permission to complete the course. The prof will want to know what program and year you are in and why you want to take their course. E-mails granting permission to take the course should be forwarded to Riddell.Advisor@umanitoba.ca.

Topics Courses

Topics courses are marked with a T (T). Topics may vary each term and must be suitable to the Focus Area. Pay close attention to the topic course title for the section i.e. (when entitled) and verify whether the topic is included in the list of approved courses for your selected Focus Area.

Cross-Listed Courses

A cross-listed course is one that is offered by more than one discipline, department or faculty, but has the same content and in which students should expect to have the same or similar experience.

Cooperative Education Option

The Clayton H. Riddell Faculty of Environment, Earth, and Resources Cooperative Education Option is a four-year undergraduate program with mandatory courses and work terms in addition to regular studies. Co-op students are renowned for their high academic standards and a strong work ethic. Technical knowledge, professional development, and maturity are only a few of the skills that students acquire from their participation in the program. To enroll in the program, contact:

Leslie Goodman, Coordinator
Phone: (204) 474-7252
Email: **Leslie.Goodman@umanitoba.ca**

Jodena Baertsoen, Assistant
Phone : (204) 474-6225
Email: **Jodena.Baertsoen@umanitoba.ca**

The Clayton H. Riddell Faculty of Environment, Earth, and Resources operates a Cooperative Education program, which is designed to provide bright and motivated students with an opportunity to gain practical work experience. The program has been connecting students and employers since its inception in 1994. The goal of the program is for students to gain valuable skills by combining university education and employment training.

Benefits to the Student

- Earn while you learn!
- You will be provided career information and guidance to help make important course choices and career decisions.
- Your performance will be evaluated, and this is available to you for further promotion and employment recruitment.

Career Opportunities

Graduates from the Environmental Studies and Science programs have found successful employment in a wide range of fields. These include ecology, parks management, Geographic Information Systems land evaluation, trace contaminant and hazardous waste management, environmental education, and global environmental issues. The primary employers are private consultants, multinationals, government departments, crown corporations, and environmental non-governmental organizations. Other opportunities exist with Parks Canada, Provincial Parks, Dept. of Conservation, Federal Fisheries and Oceans, Nunavut Wildlife Management Boards, wildlife non-government agencies, Nature Conservancy, Ducks Unlimited, and World Wildlife Foundation.

Graduates are hired in the health sciences and international development agencies. They may also gain employment as community health officers, health care planners (ministry level as well as the RHAs), international aid workers and with the Red Cross.

Opportunities also exist with organizations such as the International Institute of Sustainable Development, Manitoba Habitat Heritage Corporation, Ducks Unlimited, municipal, provincial and federal parks and the Nature Conservancy.

Visit Career Services: https://www.umanitoba.ca/career-services

CONSERVATION AND BIODIVERSITY

Conservation and Biodiversity deals with the plight of endangered species (plants and animals) and their habitats. Students might be interested in areas such as wetland ecology, prairies restoration, boreal forest management, or alpine systems. Maintenance and protection of habitat critical for the preservation of endangered species is explored.
For students in Environmental Studies, BIOL 1030 is recommended if you are interested in a Conservation and Biodiversity focus (BIOL 1030 may be used in lieu of BIOL 1010).

Faculty Members with Expertise: Drs. Stephane McLachlan, Eric Collins, and Lisa Loseto.

Selection of Relevant Courses:

ENVR 2180	Introductory Toxicology ((BIOL 1030 or HEAL 1502) and ((CHEM 1100 and CHEM 1120) or one of CHEM 1110 or CHEM 1130)) (also offered as BIOL 2380 and AGRI 2180)
ENVR 3000 (T)	Environment and Tourism (when titled) (Department Head Approval; also offered as GEOG 3770)
ENVR 3020 (T)	Environmental Science Field Investigations (when titled) (Department Head Approval)
ENVR 3140	Aquatic Ecosystem Services (Department Head Approval, and 60 credit hours)
ENVR 3250	Environmental Assessment (ABIZ 3550 or ENVR 3160 and AGEC 2370 or BIOL 2300 or BIOL 2390)
ENVR 4000 (T)	Advanced Topics in Ecosystem Services (when titled) (Department Head Approval)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Geotourism: Geology and Culture (when titled) (Department Head Approval; also offered as GEOG 4670 or GEOL 4270)
ENVR 4000 (T)	Human Dimensions of Wildlife (when titled) (Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Environmental Effects Monitoring (when titled) (Department Head Approval and 60 credit hours)
ENVR 4020 (T)	Environmental Science Field Investigations (when titled) (Department Head Approval)
ENVR 4050	Ecosystem Management (Department Head Approval; also offered as GEOG 4050)
ENVR 4060	Biogeography (Department Head Approval; also offered as GEOG 4060)
ENVR 4850	Wildlife Management (Department Head Approval)
GEOG 2200	Introduction to Thematic Cartography (3 credit hours from Geography courses numbered at the 1000 level)
GEOG 2900	Geography of Canadian Prairie Landscapes (3 credit hours from Geography courses numbered at the 1000 level or Department Head Approval)
GEOG 3770 (T)	Environment and Tourism (when titled) (Department Head Approval; also offered as ENVR 3000)
GEOG 3860	Animal Geographies (Department Head Approval)
GEOG 3920	Biological Oceanography (Instructor or Department Head Approval)
GEOG 4050	Ecosystem Management (Department Head Approval; also offered as ENVR 4050)
GEOG 4060	Biogeography (Department Head Approval; also offered as ENVR 4060)
GEOG 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as REC 4350)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
GEOG 4670 (T)	Geotourism: Geology and Culture (when titled) (Department Head Approval; also offered as ENVR 4000 or GEOL 4270)
GEOG 4670 (T)	Human Dimensions of Wildlife (when titled) (Department Head Approval; also offered as ENVR 4000)
GEOG 4750	Understanding Contemporary Environmentalism: Power and Discourse (Permission of the Instructor)
GEOL 2390	Environmental Geology (University Geology or GEOG 1290)
GEOL 2570	Energy and Mineral Resources (Any university-level Geology course)
GEOL 4270 (T)	Geotourism: Geology and Culture (when titled) (Department Head Approval also offered as ENVR 4000 or GEOG 4670)

*See next page for additional courses in the **Conservation and Biodiversity** focus area.*
*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

CONSERVATION AND BIODIVERSITY

Conservation and Biodiversity deals with the plight of endangered species (plants and animals) and their habitats. Students might be interested in areas such as wetland ecology, prairies restoration, boreal forest management, or alpine systems. Maintenance and protection of habitat critical for the preservation of endangered species is explored.
For students in Environmental Studies, BIOL 1030 is recommended if you are interested in a Conservation and Biodiversity focus (BIOL 1030 may be used in lieu of BIOL 1010).

Faculty Members with Expertise: Drs. Stephane McLachlan, Eric Collins, and Lisa Loseto.

Selection of Relevant Courses:

AGRI 2180	Introductory Toxicology ((BIOL 1030 or HEAL 1502) and ((CHEM 1100 and CHEM 1120) or one of CHEM 1110 or CHEM 1130)) (also offered as ENVR 2180 and BIOL 2380)
BIOL 2200	The Invertebrates (BIOL 1030)
BIOL 2210	The Chordates (BIOL 1030)
BIOL 2380	Introductory Toxicology ((BIOL 1030 or HEAL 1502) and ((CHEM 1100 and CHEM 1120) or one of CHEM 1110 or CHEM 1130)) (also offered as ENVR 2180 and AGRI 2180)
BIOL 3242	Vascular Flora of Manitoba (BIOL 2240 or BIOL 2242 or Permission of Department)
BIOL 3280	Forest Botany (BIOL 2242 (C); and one of BIOL 2300 or AGEC 2370 (C) or Permission of Department)
BIOL 3310	Foundations of Population Ecology (AGEC 2370 or BIOL 2300 ; and one of STAT 1150 or STAT 2000 or Permission of Department)
BIOL 3312	Community Ecology (AGEC 2370 or BIOL 2300 ; and one of STAT 1150 or STAT 2000 or AGRI 2400 or Permission of Department)
BIOL 3314	Field Ecology (AGEC 2370 or BIOL 2300 ; and one of STAT 1150 or STAT 2000 or Permission of Department)
BIOL 3318	Boreal Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3350	Methods of Data Collection and Analysis in Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 2000 or Permission of Department)
BIOL 3360	Animal Behavior (AGEC 2370 or BIOL 2300 ; and BIOL 2210; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3372	Wetland Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3600	Biological Diversity and Sustainability (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000)
BIOL 4210	Biology of Fishes (BIOL 2210)
BIOL 4214	Biology of Amphibians and Reptiles (BIOL 2210 or Permission of Department)
BIOL 4216	Biology of Birds (BIOL 2210)
BIOL 4218	Biology of Mammals (BIOL 2210 and AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 4220	Marine Biodiversity (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 1000 or Permission of Department)
BIOL 4262	Wildlife and Fisheries Parasitology (BIOL 3270)
BIOL 4310	Applications of Population Ecology in Fisheries and Wildlife (BIOL 3310)
BIOL 4314	Arctic Field Ecology (one of BIOL 2300, BIOL 2301, or AGEC 2370; and one of STAT 1150, STAT 1000 or STAT 1000; and instructor permission)
BIOL 4362	Behavioural Ecology and Cognitive Ethology (BIOL 3360 or Permission of Department)
ENTM 3160	Veterinary and Wildlife Entomology
REC 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as GEOG 4350)
SOIL 3520	Pesticides: Environment, Economics and Ethics
SOIL 3600	Soils and Landscapes in Our Environment
SOIL 4500	Remediation of Contaminated Land (SOIL 3600 or Permission of the Instructor)
SOIL 4510	Soil and Water Management (SOIL 3600)
WOMN 3130	Gender, Race and Environmental Justice (3 credit hours of Women's and Gender Studies courses or Permission of the Instructor)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

ENVIRONMENTAL ASSESSMENT

Environmental Assessment covers an array of skills to predict the environmental effects of proposed initiatives before they are carried out by identifying possible environmental effects, proposing measures to mitigate adverse effects and by predicting whether there will be significant adverse environmental effects, even after the mitigation is implemented. (Canadian Environmental Assessment Agency)

Faculty Members with Expertise: Drs. Stephane McLachlan, Juliana Marson, and Johny Stephen.

Selection of Relevant Courses:

ENVR 3000 (T)	Introduction to Numerical Modelling and Applications in Environmental Sciences (when titled) (Department Head Approval, and 60 credit hours of university credit)
ENVR 3110	Environmental Conservation and Restoration (BIOL 2390 or AGEC 2370 or BIOL 2300)
ENVR 3140	Aquatic Ecosystem Services (Department Head Approval, and 60 credit hours of university credit)
ENVR 3250	Environmental Assessment (ABIZ 3550 or ENVR 3160 and AGEC 2370 or BIOL 2300 or BIOL 2390)
ENVR 3750	Green Building and Planning (ENVR 2000 and 57 credit hours)
ENVR 3850	Sustainable Manitoba (60 credit hours; also offered as GEOG 3850)
ENVR 4000 (T)	Advanced Topics in Ecosystem Services (when titled) (Department Head Approval)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Environmental Effects Monitoring (when titled) (Department Head Approval and 60 credit hours of university credit)
ENVR 4050	Ecosystem Management (Department Head Approval; also offered as GEOG 4050)
ENVR 4650	Advanced Issues in Environmental Law and Policy (ENVR 3160)
ENVR 4850	Wildlife Management (Department Head Approval)
GEOG 2330	Place, Populations and Mobility: Geographic Perspectives (3 credit hours from Geography courses numbered at the 1000 level)
GEOG 2520	Geography of Natural Resources (3 credit hours from Geography courses at the 1000 level)
GEOG 2630	Geography of Culture and Environment (GEOG 1280)
GEOG 2870	Introduction to Economic Geography (3 credit hours from Geography courses at the 1000 level)
GEOG 3340	Migration and Mobility in a Globalized World (GEOG 2330)
GEOG 3850	Sustainable Manitoba (60 credit hours; also offered as ENVR 4850)
GEOG 3920	Biological Oceanography (Instructor or Department Head Approval)
GEOG 4050	Ecosystem Management (Department Head Approval; also offered as ENVR 4050)
GEOG 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as REC 4350)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
GEOG 4750	Understanding Contemporary Environmentalism: Power and Discourse (Permission of the instructor)
BIOL 3600	Biological Diversity and Sustainability (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000)
ECON 2400	Introduction to Energy Economics (6 credit hours of 1000 level Economics)
ECON 3710	Sustainable Development: Issues and Policies (6 credit hours of 1000 level Economics)
REC 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as GEOG 4350)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

ENVIRONMENTAL HEALTH

"Environment and Health is a growing area of research and an area of influence on government policy. This wide-ranging field includes things like the analysis of how polluted environments influence human health, how the state of health care systems impacts the health of both individuals and particular user groups such as the elderly or new immigrants, the relationship between access to adequate housing and food supplies in poor neighbourhoods or remote rural communities, and the causes and impacts of community-wide measures of health, such as fitness levels or disease rates."
- Dr. Bonnie Hallman, Environment and Health Professor, University of Manitoba.

Faculty Members with Expertise: Drs. Bonnie Hallman, Eric Collins, and Kristina Brown

Selection of Relevant Courses:

ENVR 3400	Introduction to Environment and Health (60 credit hours of university credit)
ENVR 3890	Geography of Wellness (ENVR 1000 or GEOG 1280 or GEOG 1700 or GPE 1700 or Department Head Approval; also offered as GEOG 3890)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
ENVR 4400	Advanced Issues in Environment and Health (ENVR 3400)
ENVR 4650	Advanced Issues in Environmental Law and Policy (ENVR 3160 or Department Head Approval)
GEOG 3870	Food Geographies (GEOG 1280 or HNSC 1200 or Department Head Approval)
GEOG 3890	Geography of Wellness (ENVR 1000 or GEOG 1280 or GEOG 1700 or GPE 1700 or Department Head Approval; also offered as ENVR 3890)
GEOG 4290	Geographies of Health and Health Care (Department Head Approval)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
AGRI 2300	Indigenous Issues in Food Systems
ANTH 2560	Anthropology of Illness (ANTH 1220 or ANTH 1520 or Permission of the Instructor)
BIOL 2410	Human Physiology 1 (BIOL 1030 or BIOL 1412; or a "C+" or better in both BIOL 1000 and BIOL 1010)
BIOL 2420	Human Physiology 2 (BIOL 2410 (D), or BIOL 3460 (D) or Permission of Department)
BIOL 3600	Biological Diversity and Sustainability (AGEC 2370 or BIOL 2300 or BIOL 1030 and BIOL 2390; and one of STAT 1150, STAT 1000)
CHEM 2100	Organic Chemistry 1: Foundations of Organic Chemistry ((CHEM 1110) and (one of CHEM 1120, or CHEM 1126) or (the former CHEM 1310))
CHEM 2110	Organic Chemistry 2: Foundations of Organic Synthesis (one of CHEM 2100 or the former CHEM 2210)
CHEM 2510	Introduction to Analytical Chemistry (CHEM 1110 and (one of CHEM 1120 or CHEM 1126)) or (the former CHEM 1310)
CHEM 2700	Biochemistry 1: Biomolecules and an Introduction to Metabolic Energy ((CHEM 1110) and (one of CHEM 1120 or CHEM 1126) or (the former CHEM 1310)) and (BIOL 1030))
CHEM 2710	Biochemistry 2: Catabolism, Synthesis, and Information Pathways (one of CHEM 2700, the former CHEM 2360, MBIO 2700, the former MBIO 2360) and (one of CHEM 2100, the former CHEM 2210)
ENTM 4250	Pesticide Toxicology (A course in Biochemistry)
EVLU 4006 (T)	Health and Community Design (when titled)
FOOD 4150	Food Microbiology 1
FOOD 4260	Water Management in Food Processing ([CHEM 1110 (CHEM 1111) or CHEM 1130] and [MATH 1300 (MATH 1301) or MATH 1210])
INDG 3240	Indigenous Medicine and Health
LABR 3060	Workplace Health and Safety (LABR 1260 and LABR 1290 or both HRIR 3450 and 6 credit hours of other HRIR courses or written consent of the Labour Studies coordinator)
MBIO 3010	Mechanisms of Microbial Disease (MBIO 2020)
WOMN 3130	Gender, Race and Environmental Justice (3 credit hours of WOMN course or Permission of the Instructor)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

LAND SYSTEMS

The properties and processes responsible for land systems are controlled by geological material, soil and land features found on Earth. This focus area examines the processes and techniques that are applicable to land systems. This is accomplished through an investigation from micro (mineralogy/soil ecology) through to macro scale (land use / geomorphology).

Faculty Members with Expertise: Drs. David Walker, John Iacozza, Dustin Isleifson, and Karen Alley.

Selection of Relevant Courses:

ENVR 2010 (T)	MEIA Soil Sampling (1.5 credit hours) (when titled) (Department Head Approval)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
GEOG 2200	Introduction to Thematic Cartography (3 credit hours of GEOG 1000 level or Department Head Approval)
GEOG 2272	Natural Hazards (one of GEOG 1290, GEOL 1340, or GEOL 1410 or Department Head Approval)
GEOG 2550	Geomorphology (GEOG 1290 or Department Head Approval)
GEOG 2870	Introduction to Economic Geography (3 credit hours of GEOG 1000 level)
GEOG 4200	Advanced Methods in Remote Sensing (GEOG 3200 or Department Head Approval)
GEOG 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as REC 4350)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
GEOL 2390	Environmental Geology (University Geology or GEOG 1290)
GEOL 2440	Structural Geology (GEOL 1340 (C+) and one of MATH 1300, MATH 1500, MATH 1510 or MATH 1520)
GEOL 2500	Introduction to Mineralogy ((GEOL 1340 (C+) and [one of Chemistry 40S (50%), CKSL 0100 (P) or the former CHEM 0900 (Pass)]; (CHEM 1100) and (one of CHEM 1120, or CHEM 1126) are highly recommended)
GEOL 2570	Energy and Mineral Resources (Any university-level Geology course)
GEOL 2770	Principles of Inorganic Geochemistry ([GEOL 2500 or the former GEOL 2540] and [one of MATH 1300, MATH 1210, MATH 1230, MATH 1500, MATH 1510, or MATH 1520]; Pre or Corequisite: [(CHEM 1100) and (one of CHEM 1120 or CHEM 1126)] or the former CHEM 1300)
SOIL 3520	Pesticides: Environment, Economics and Ethics
SOIL 3600	Soils and Landscapes in our Environment
SOIL 3610	Field Methods in Land Resource Science (SOIL 3600)
SOIL 4060	Physical Properties of Soils (SOIL 3600 or BIOE 2790 or former BIOE 2110 or Permission of the Instructor)
SOIL 4130	Soil Chemistry and Mineralogy (SOIL 3600 or Permission of the Instructor)
SOIL 4400	Soil Ecology (AGEC 2370 or BIOL 2300 or SOIL 3600)
SOIL 4500	Remediation of Contaminated Land (SOIL 3600 or Permission of the Instructor)
SOIL 4510	Soil and Water Management (SOIL 3600)
SOIL 4520	Soil Fertility (SOIL 3600)
REC 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as GEOG 4350)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

NATURAL RESOURCE MANAGEMENT

Natural resource management refers to the management of natural resources such as land, water, soil, plants and animals, with a particular focus on the reasonable and sustainable use of natural resources, balanced with conservation, to ensure quality of life for future generations. Natural resource management specifically focuses on a scientific and technical understanding of resources and ecology and the life-supporting capacity of those resources.

Faculty Members with Expertise: Drs. Jonathan Peyton, David Walker, and Johny Stephen.

Selection of Relevant Courses:

ENVR 3000 (T)	Contemporary Environmental Issues in the Arctic (when titled) (Department Head Approval)
ENVR 3000 (T)	Environment and Tourism (when titled) (Department Head Approval; also offered as GEOG 3770)
ENVR 3020 (T)	Environmental Science Field Investigations (when titled) (Department Head Approval)
ENVR 3850	Sustainable Manitoba (60 credit hours or Department Head Approval; also offered as GEOG 3850)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Human Dimensions of Wildlife (when titled) (Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Environmental Effects Monitoring (when titled) (Department Head Approval and 60 credit hours)
ENVR 4000 (T)	Winnipeg's Urban Nature (when titled) (Department Head Approval; also offered as GEOG 4670)
ENVR 4020 (T)	Environmental Science Field Investigations (when titled) (Department Head Approval)
ENVR 4050	Ecosystem Management (Department Head Approval; also offered as GEOG 4050)
ENVR 4060	Biogeography (Department Head Approval; also offered as GEOG 4060)
ENVR 4650	Advanced Issues in Environmental Law and Policy (ENVR 3160 or Department Head Approval)
ENVR 4800	Climate and Society (3 credit hours of 2000- or 3000- or 4000- level GEOG or ENVR, or Permission of the Instructor; may not be held with ENVR 4000, or GEOG 4670 when titled as Climate and Society; also offered as GEOG 4800)
ENVR 4850	Wildlife Management (Department Head Approval)
GEOG 2520	Geography of Natural Resources (3 credit hours of GEOG 1000 level)
GEOG 2870	Introduction to Economic Geography (3 credit hours of GEOG 1000 level)
GEOG 3770 (T)	Environment and Tourism (when titled) (Department Head Approval; also offered as ENVR 3000)
GEOG 3850	Sustainable Manitoba (60 credit hours or Department Head Approval; also offered as ENVR 3850)
GEOG 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as REC 4350)
GEOG 4050	Ecosystem Management (Department Head Approval; also offered as ENVR 4050)
GEOG 4060	Biogeography (Department Head Approval; also offered as ENVR 4060)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
GEOG 4670 (T)	Human Dimensions of Wildlife (when titled) (Department Head Approval; also offered as ENVR 4000)
GEOG 4670 (T)	Winnipeg's Urban Nature (when titled) (Department Head Approval; also offered as ENVR 4000)
GEOG 4750	Understanding Contemporary Environmentalism: Power and Discourse (Permission of the Instructor)
GEOG 4800	Climate and Society (3 credit hours of 2000- or 3000- or 4000- level GEOG or ENVR, or Permission of the Instructor; may not be held with ENVR 4000, or GEOG 4670 when titled as Climate and Society; also offered as ENVR 4800)

*See next page for additional courses in the **Natural Resource Management** focus area.*
*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

NATURAL RESOURCE MANAGEMENT

Natural resource management refers to the management of natural resources such as land, water, soil, plants and animals, with a particular focus on the reasonable and sustainable use of natural resources, balanced with conservation, to ensure quality of life for future generations. Natural resource management specifically focuses on a scientific and technical understanding of resources and ecology and the life-supporting capacity of those resources.

Faculty Members with Expertise: Drs. Jonathan Peyton, David Walker, and Johny Stephen.

Selection of Relevant Courses:

BIOL 2200	The Invertebrates (BIOL 1030)
BIOL 2210	The Chordates (BIOL 1030)
BIOL 3242	Vascular Flora of Manitoba (BIOL 2240 or BIOL 2242 or Department Head Approval)
BIOL 3318	Boreal Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3350	Methods of Data Collection and Analysis in Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 2000 or Permission of Department)
BIOL 3360	Animal Behavior (AGEC 2370 or BIOL 2300; and BIOL 2210; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3372	Wetland Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3600	Biological Diversity and Sustainability (AGEC 2370 or BIOL 2300; or BIOL 1030 and BIOL 2390, and one of STAT 1150, STAT 1000)
BIOL 4210	Biology of Fisheries (BIOL 2210)
BIOL 4214	Biology of Amphibians and Reptiles (BIOL 2210 or Permission of Department)
BIOL 4216	Biology of Birds (BIOL 2210)
BIOL 4218	Biology of Mammals (BIOL 2210 and AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
ENTM 3160	Veterinary and Wildlife Entomology
INDG 2030	Working with Indigenous Elders ((INDG 1200 or the former NATV 1200) or (INDG 1220 (or the former NATV 1220)) and INDG 1240 (or the former NATV 1240) or written consent of instructor or department head)
INDG 2110	Introduction to Indigenous Community Development ([INDG 1200 or the former NATV 1200] or [INDG 1220 (or the former NATV 1220) and INDG 1240 (or the former NATV 1240)] or written consent of department head)
REC 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as GEOG 4350)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

NORTHERN STUDIES

The Northern Studies stream provides students with an opportunity to explore individual interests in any combination of human, physical, and natural relationships in the North. Courses range from the physical aspects of climate change to cultural diversity across the Canadian and the Circumpolar Arctic, Boreal and Antarctic regions. Field trips, discussions, and internationally renowned researchers provide students with a wide range of perspectives and once in a lifetime experiences.

Faculty Members with Expertise: Drs. Stephane McLachlan, Lisa Loseto, Jonathan Peyton, Eric Collins, Jens Ehn, Juliana Marson, Alex Crawford, and Kristina Brown.

Selection of Relevant Courses:

ENVR 3000 (T)	Contemporary Environmental Issues in the Arctic (when titled) (Department Head Approval and 60 credit hours)
ENVR 3000 (T)	What is North? Environmental and Geographical Concepts (when titled) (Department Head Approval and 60 credit hours)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
GEOG 2640	Geography of Culture and Inequality (GEOG 1200 or GEOG 1280 or Permission of Instructor)
GEOG 2870	Introduction to Economic Geography (3 credit hours of GEOG 1000 level)
GEOG 3760 (T)	Canadian Natural Environments & Landscapes (6) (when titled) (Department Head Approval)
GEOG 3770 (T)	International Development Issues/Global Issues (when titled) (Department Head Approval)
GEOG 4260	Sacred Lands (Department Head Approval)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
ANTH 3500	Archaeology of Inuit Nunangat (formerly titled as Peoples of the Arctic) (ANTH 1210 or ANTH 1520 or Permission of Instructor)
BIOL 3318	Boreal Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 4890 (T)	Special Topics in Arctic Ecology (when titled) (Permission of Department)
ECON 2350	Community Economic Development
INDG 2012	Indigenous History in Canada (6)
INDG 2080	Inuit Society and Culture ([INDG 1200 or the former NATV 1200] or [INDG 1220 (or the former NATV 1220) and INDG 1240 (or the former NATV 1240)] or written consent of department head]
INDG 2110	Introduction to Indigenous Community Development ([INDG 1200 or the former NATV 1200] or [INDG 1220 (or the former NATV 1220) and INDG 1240 (or the former NATV 1240)] or written consent of department head)
INDG 3240	Indigenous Medicine and Health
INDG 3330	Indigenous Science, Technology, and Society (formerly titled Indigenous People, Science, and the Environment) (INDG 1200 or INDG 1220 (or the former NATV 1220) and INDG 1240 (or the former NATV 1240) or written consent of instructor)
INDG 4220	Environment, Economy and Indigenous Peoples (Permission of the Instructor)
INDG 4240	Arctic Lifestyles (Permission of the Instructor)
INDG 4320	Indigenous Economic Leadership ([INDG 1200 (or the former NATV 1200)] or [INDG 1220 (or the former NATV 1220) and INDG 1240 (or the former NATV 1240)] or written consent of instructor)
POLS 3872	Indigenous Governance
SWRK 4220	Aboriginal People and Social Work Practice (6) (SWRK 1310, SWRK 2080, SWRK 2090, and SWRK 3140)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

POLICY AND LAW

Policy and Law are the foundation for understanding how environmental problems is addressed systematically. From international agreements on climate change, to fostering local green businesses, to developing clean energy technologies - understanding, implementing and improving environmental policy and law is key.

Faculty Members with Expertise: Drs. Nicole Wilson and Johny Stephen.

Selection of Relevant Courses:

ENVR 3250	Environmental Assessment (ABIZ 3550 or ENVR 3160 and AGEC 2370 or BIOL 2300 or BIOL 2390 or Instructor or Department Head Approval)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
ENVR 4650	Advanced Issues in Environmental Law and Policy (ENVR 3160 or Department Head Approval)
ENVR 4800	Climate and Society (3 credit hours of 2000- or 3000- or 4000- level GEOG or ENVR, or Permission of the instructor; also offered as GEOG 4800)
GEOG 2640	Geography of Culture and Inequality (GEOG 1280 or GEOG 1700 or GPE 1700 or Department Head Approval)
GEOG 2870	Introduction to Economic Geography (3 credit hours of GEOG 1000 level)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
GEOG 4750	Understanding Contemporary Environmentalism: Power and Discourse (Permission of the instructor)
GEOG 4800	Climate and Society (3 credit hours of 2000- or 3000- or 4000- level GEOG or ENVR, or Permission of the Instructor; may not be held with ENVR 4000, or GEOG 4670 when titled as Climate and Society; also offered as ENVR 4800)
ABIZ 3550	Environmental Policy (ABIZ 2390 or ECON 2390)
ANTH 2000	Culture, Society, and Power (ANTH 1220 or ANTH 1520 or Permission of the Instructor)
ANTH 2430	Ecology, Technology and Society
ANTH 2500	Culture, Environment, and Technology (ANTH 1220 or ANTH 1520 or Permission of the Instructor)
ECON 3710	Sustainable Development: Issues and Policy (6 credit hours of 1000 level Economics)
GPE 3700	A Survey of Global Political Economy (GPE 1700 or GEOG 1700 or Permission of the Instructor)
INDG 3000 (T)	Hydro-power Development and Indigenous Communities in Manitoba (when titled) ([INDG 1200 or the former NATV 1200] or [(INDG 1220 or the former NATV 1220) and (INDG 1240 or the former NATV 1240)] or Department Head Approval)
INDG 3280	Indigenous Peoples and the Canadian Justice System ([INDG 1200 (or the former NATV 1200)] or [INDG 1220 (or the former NATV 1220) and INDG 1240 (or the former NATV 1240)] or Department Head Approval)
INDG 4220	Environment, Economy and Indigenous Peoples (Permission of the Instructor)
INDG 4240	Arctic Lifestyles (Permission of the Instructor)
LABR 3010	Labour Law (LABR 1260 and LABR 1290 or HRIR 3450 and 6 credit hours of other HRIR courses or written consent of the Labour Studies coordinator)
PHIL 2750	Ethics and the Environment
POLS 2502	Introduction to International Relations (formerly titled as Introduction to World Affairs)
POLS 2504	Course No Longer Offered (Introduction to International Relations or POLS 2040)
POLS 2802	Introduction to Indigenous Politics
POLS 3470	Canadian Public Management (POLS 2902 or Instructor or Department Head Approval)
POLS 3872	Indigenous Governance
SOC 3380	Power, Politics and the Welfare State (SOC 1000 or the former SOC 1200; or Permission of the Instructor)
SOC 3762	Law, Justice, and Indigenous Peoples (SOC 1000 or the former SOC 1200)
SOC 3838	Ecology and Society (SOC 1000 or the former SOC 1200)
WOMN 3130	Gender, Race and Environmental Justice (3 credit hours of WOMN course or Permission of the Instructor)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

STEWARDSHIP

Stewardship is maintaining natural resources for future generations. Stewardship means, as humans we are responsible for our actions on earth. Future generations are dependent upon the continuity of the natural environment. We must respect life and integrate our uses of the natural environment. We must respect life and integrate our uses of the natural resources in a manner compatible with the continuity on earth. It requires a lot of education, research, work and dedication to successfully change the current systems to create and/or enhance sustainability of our actions.

Faculty Members with Expertise: Drs. Stephane McLachlan, Eric Collins, and Johny Stephen.

Selection of Relevant Courses:

ENVR 3110	Environmental Conservation and Restoration (BIOL 2390 or AGEC 2370 or BIOL 2300)
ENVR 3250	Environmental Assessment (ABIZ 3550 or ENVR 3160 and AGEC 2370 or BIOL 2300 or BIOL 2390)
ENVR 3750	Green Building and Planning (ENVR 2000 and 57 credit hours)
ENVR 3850	Sustainable Manitoba (60 credit hours or Department Head Approval; also offered as GEOG 3850)
ENVR 4000 (T)	Applied Qualitative Research: Making a Difference (when titled) (Department Head Approval)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
ENVR 4050	Ecosystem Management (Department Head Approval; also offered as GEOG 4050)
ENVR 4060	Biogeography (Department Head Approval; also offered as GEOG 4060)
ENVR 4650	Advanced Issues in Environmental Law and Policy (ENVR 3160 or Department Head Approval)
ENVR 4850	Wildlife Management (Permission of Instructor)
GEOG 2520	Geography of Natural Resources (3 credit hours of GEOG 1000 level)
GEOG 2870	Introduction to Economic Geography (3 credit hours of GEOG 1000 level)
GEOG 3640	Social Geography of the Environment (GEOG 1200 or GEOG 1280 or Department Head Approval)
GEOG 3850	Sustainable Manitoba (60 credit hours or Department Head Approval; also offered as ENVR 3850)
GEOG 4050	Ecosystem Management (Department Head Approval; also offered as ENVR 4050)
GEOG 4060	Biogeography (Department Head Approval; also offered as ENVR 4060)
GEOG 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as REC 4350)
GEOG 4670 (T)	Applied Qualitative Research: Making a Difference (when titled) (Department Head Approval; also offered as ENVR 4000)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
GEOG 4750	Understanding Contemporary Environmentalism: Power and Discourse (Permission of the Instructor)
GEOL 4370	Global Change (GEOL 3900 and GEOL 3490)
ANTH 2000	Culture, Society, and Power (ANTH 1220 or ANTH 1520 or Permission of the Instructor)
ANTH 2430	Ecology, Technology and Society
ANTH 2500	Culture, Environment, and Technology (ANTH 1220 or ANTH 1520 or Permission of the Instructor)
BIOL 3318	Boreal Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3600	Biological Diversity and Sustainability (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000)
ECON 2400	Introduction to Energy Economics (6 credit hours of 1000 level Economics)
ECON 3710	Sustainable Development: Issues and Policies (6 credit hours of 1000 level Economics)
INDG 3280	Indigenous Peoples and the Canadian Justice System ([INDG 1200 (or the former NATV 1200)] or [INDG 1220 (or the former NATV 1220) and INDG 1240 (or the former NATV 1240)] or consent of department head)
INDG 4220	Environment, Economy and Indigenous Peoples (Permission of the Instructor)
PHIL 2750	Ethics and the Environment
REC 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as GEOG 4350)
WOMN 3130	Gender, Race and Environmental Justice (3 credit Hours of Women's and Gender Studies courses or Permission of the Instructor)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

SUSTAINABLE BUILDING

Sustainable Building, or Green Building describes projects that are sited to promote livable communities; protect sensitive lands and preserve natural resources; are energy efficient and/or use renewable energy; incorporate environmentally friendly building materials and practices; and promote occupant health and well-being. As with all issues of sustainability the solutions are particular to the place and people.

Faculty Members with Expertise: TBA.

Selection of Relevant Courses:

ENVR 3250	Environmental Assessment (ABIZ 3550 or ENVR 3160 and AGEC 2370 or BIOL 2300 or BIOL 2390)
ENVR 3750	Green Building and Planning (ENVR 2000 and 57 credit hours)
ENVR 3850	Sustainable Manitoba (60 credit hours or Department Head Approval; also offered as GEOG 3850)
GEOG 2272	Natural Hazards (one of GEOG 1290, GEOL 1340, or GEOL 1410, GEOG 1200, GEOL 1360 or Department Head Approval)
GEOG 2630	Geography of Culture and the Environment (GEOG 1200 or GEOG 1280 or Department Head Approval)
GEOG 2870	Introduction to Economic Geography (3 credit hours of GEOG 1000 level)
GEOG 3460	Urban Geography (6) (GEOG 1200 or GEOG 1280 or Department Head Approval)
GEOG 3850	Sustainable Manitoba (60 credit hours or Department Head Approval; also offered as ENVR 3850)
EVDS 2200	Ecology and Design (EVDS 2702)
EVDS 2702	Natural and Human Systems (EVDS 1680 (C+))
EVLU 3002	Site Planning (Permission by the Faculty of Architecture)
EVLU 3010	Landscape and Urbanism Theory (Permission by the Faculty of Architecture)
EVLU 3014	Placemaking Fundamentals (Permission by the Faculty of Architecture)
EVLU 4006 (T)	Health and Community Design (when titled) (Permission by the Faculty of Architecture)
EVLU 4006 (T)	Child-Friendly Cities (when titled) (Permission by the Faculty of Architecture)
EVLU 4008	Plants, Ecosystems and Designs (Permission by the Faculty of Architecture)
EVLU 4018	Principles of Urban Design (Permission by the Faculty of Architecture)
PHIL 2750	Ethics and the Environment
SOC 3838	Ecology and Society (SOC 1000 or the former SOC 1200)
SOC 3840	Community and Social Reconstruction (SOC 1000 or the former SOC 1200)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

SUSTAINABLE DEVELOPMENT

Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations. The achievement of sustainable development requires the integration of its economic, environmental and social components at all levels.

Faculty Members with Expertise: Drs. Bruce Erickson, Eric Collins, Michael Campbell, and Johny Stephen.

Selection of Relevant Courses:

ENVR 3000 (T)	Contemporary Environmental Issues in the Arctic (when titled) (Department Head Approval)
ENVR 3000 (T)	Environment and Tourism (when titled) (Department Head Approval; also offered as GEOG 3770)
ENVR 3250	Environmental Assessment (ABIZ 3550 or ENVR 3160 and AGEC 2370 or BIOL 2300 or BIOL 2390)
ENVR 3400	Introduction to Environment and Health (60 credit hours of university credit)
ENVR 3750	Green Building and Planning (ENVR 2000 and 57 credit hours)
ENVR 3850	Sustainable Manitoba (60 credit hours or Department Head Approval; also offered as GEOG 3850)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Human Dimensions of Wildlife (when titled) (Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Winnipeg's Urban Nature (when titled) (Department Head Approval; also offered as GEOG 4670)
ENVR 4050	Ecosystem Management (Department Head Approval; also offered as GEOG 4050)
ENVR 4650	Advanced Issues in Environmental Law and Policy (ENVR 3160 or Department Head Approval)
ENVR 4800	Climate and Society (when titled) (3 credit hours of 2000- or 3000- or 4000- level GEOG or ENVR or Permission of the Instructor; also offered as GEOG 4800)
GEOG 2330	Place, Populations and Mobility: Geographic Perspectives (3 credit hours of GEOG 1000 level)
GEOG 2520	Geography of Natural Resources (3 credit hours of GEOG 1000 level)
GEOG 2630	Geography of Culture and the Environment (GEOG 1200 or GEOG 1280 or Department Head Approval)
GEOG 2640	Geography of Culture and Inequality (GEOG 1200 or GEOG 1280 or Permission of Instructor)
GEOG 2870	Introduction to Economic Geography (3 credit hours of GEOG 1000 level)
GEOG 3272	Social Vulnerability to Natural Hazards (3 credit hours of GEOG 1000 level or GPE 1700 or GEOL 1340 or GEOL 1410)
GEOG 3460	Urban Geography (6) (GEOG 1200 or GEOG 1280 or Department Head Approval)
GEOG 3640	Social Geography of the Environment (GEOG 1200 or GEOG 1280 or Department Head Approval)
GEOG 3770 (T)	Environment and Tourism (when titled) (Department Head Approval; also offered as ENVR 3000)
GEOG 3850	Sustainable Manitoba (60 credit hours of course work; also offered as ENVR 3850)
GEOG 3870	Food Geographies (GEOG1280 or HNSC 1200 or Department Head Approval)
GEOG 4050	Ecosystem Management (Department Head Approval; also offered as ENVR 4050)
GEOG 4280	Gender and the Human Environment (6 credit hours in Geography, or Department Head Approval)
GEOG 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as REC 4350)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
GEOG 4670 (T)	Human Dimensions of Wildlife (when titled) (Department Head Approval; also offered as ENVR 4000)
GEOG 4670 (T)	Winnipeg's Urban Nature (when titled) (Department Head Approval; also offered as ENVR 4000)
GEOG 4750	Understanding Contemporary Environmentalism: Power and Discourse (Permission of Instructor)
GEOG 4800	Climate and Society (3 credit hours of 2000- or 3000- or 4000- level GEOG or ENVR, or Permission of the Instructor; may not be held with ENVR 4000, or GEOG 4670 when titled as Climate and Society; also offered as ENVR 4800)

*See next page for additional courses in the **Sustainable Development** focus area.*

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

SUSTAINABLE DEVELOPMENT

Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations. The achievement of sustainable development requires the integration of its economic, environmental and social components at all levels.

Faculty Members with Expertise: Drs. Bruce Erickson, Eric Collins, Michael Campbell, and Johny Stephen.

Selection of Relevant Courses:

AGRI 2300	Indigenous Issues in Food Systems
ANTH 2000	Culture, Society, and Power (ANTH 1220 or ANTH 1520 or Permission of the Instructor)
ANTH 2430	Ecology, Technology and Society
ANTH 2500	Culture, Environment, and Technology (ANTH 1220 or ANTH 1520 or Permission of the Instructor)
ECON 3710	Sustainable Development: Issues and Policy (6 credit hours of 1000 level Economics)
EVLU 4006 (T)	Child-Friendly Cities (when titled) (Permission by the Faculty of Architecture)
INDG 2110	Introduction to Indigenous Community Development ([INDG 1200 or the former NATV 1200] or [INDG 1220 (or the former NATV 1220) and INDG 1240 (or the former NATV 1240)] or written consent of department head)
INDG 4220	Environment, Economy, and Indigenous Peoples (Permission of the Instructor)
INDG 4230	Traditional Knowledge and Indigenous Studies Research (Permission of the Instructor)
INDG 4240	Arctic Lifestyles (Permission of the Instructor)
MKT 3246	Sustainability Marketing (MKT 2210 (D) or MKT 22112 (D))
POLS 2502	Introduction to International Relations (formerly titled as Introduction to World Affairs; also previously offered as POLS 2504)
POLS 2504	Course No Longer Offered (Introduction to International Relations or POLS 2040)
POLS 3250	International Political Economy (POL 2502, or (POLS 2043 and POLS 2045), or the former POLS 2040 or Permission of the Instructor)
REC 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as GEOG 4350)
SOC 2390	Social Organization (SOC 1000 or the former SOC 1200)
SOC 2480	Population Problems (SOC 1000 or the former SOC 1200)
SOC 3460 (T)	Building a Community Commons (when titled) (SOC 1000 or the former SOC 1200)
SOC 3460 (T)	Sociology of Consumption (when titled) (SOC 1000 or the former SOC 1200)
SOC 3838	Ecology and Society (SOC 1000 or the former SOC 1200)
SOC 3840	Community and Social Reconstruction (SOC 1000 or the former SOC 1200)
WOMN 3130	Gender, Race and Environmental Justice (3 credit hours of WOMN course or Permission of the Instructor)

Note: This list also includes ***Courses Applicable to all Focus Areas****, as detailed on page 3.*

TOXICOLOGY

Environmental toxicology deals with the potential impacts of chemical and non-chemical stressors, both natural and synthetic, on ecosystem constituents. While significant emphasis is placed on understanding the response of individual organisms, the true focus is on characterizing the effects, both direct and indirect, and the risk they pose at the ecosystem-level.

Faculty Members with Expertise: Drs. Fei Wang and Mark Hanson.

Selection of Relevant Courses:

ENVR 2180	Introductory Toxicology ((BIOL 1030 or HEAL 1502) and ((CHEM 1100 and CHEM 1120) or one of CHEM 1110 or CHEM 1130)) (also offered as BIOL 2380 and AGRI 2180)
ENVR 2550	Environmental Chemistry (also previously offered as CHEM 2550) (CHEM 1310 – see an advisor)
ENVR 3140	Aquatic Ecosystem Services (Department Head Approval and 60 credit hours of university credit)
ENVR 3180	Methods in Ecotoxicology (ENVR 2180 or BIOL 2380 or AGRI 2180, or Permission of Instructor or Department Head)
ENVR 3550	Environmental Analysis (ENVR 2550, or CHEM 2550 or CHEM 2470 – see an advisor)
ENVR 4000 (T)	Advanced Topics in Ecosystem Services (when titled) (Department Head Approval)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Environmental Effects Monitoring (when titled) (Department Head Approval and 60 credit hours of university credit)
ENVR 4180	Ecotoxicological Risk Characterization (ENVR 2180 or BIOL 2380 or AGRI 2180)
ENVR 4550	Aquatic Chemistry (ENVR 3550 or CHEM 3590 or Department Head Approval – see an advisor)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
GEOG 3920	Biological Oceanography (Instructor or Department Head Approval)
GEOL 2390	Environmental Geology (University Geology or GEOG 1290)
AGRI 2180	Introductory Toxicology ((BIOL 1030 or HEAL 1502) and ((CHEM 1100 and CHEM 1120) or one of CHEM 1110 or CHEM 1130)) (also offered as ENVR 2180 and BIOL 2380)
BIOL 2262	Biology of Algae (BIOL 1030)
BIOL 2380	Introductory Toxicology ((BIOL 1030 or HEAL 1502) and ((CHEM 1100 and CHEM 1120) or one of CHEM 1110 or CHEM 1130)) (also offered as ENVR 2180 and AGRI 2180)
BIOL 2520	Cell Biology (BIOL 1030)
BIOL 3310	Foundations of Population Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 2000 or Permission of Department)
BIOL 3312	Community Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 2000 or AGRI 2400 or Permission of Department)
BIOL 3318	Boreal Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3370	Limnology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3372	Wetland Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3470	Environmental Physiology of Animals I (BIOL 2200 or BIOL 2210 or Permission of Department)
BIOL 3472	Environmental Physiology of Animals II (BIOL 2200 or BIOL 2210 or Permission of Department)
BIOL 4380	Environmental Toxicology (one of CHEM 2370, MBIO 2370, CHEM 2780, or MBIO 2780 and one of AGEC 2370 or BIOL 2300 and one of STAT 1150, STAT 1000 and one of BIOL 2410, BIOL 3470, BIOL 3472 or Permission of Department)

*See next page for additional courses in the **Toxicology** focus area.*

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

TOXICOLOGY

Environmental toxicology deals with the potential impacts of chemical and non-chemical stressors, both natural and synthetic, on ecosystem constituents. While significant emphasis is placed on understanding the response of individual organisms, the true focus is on characterizing the effects, both direct and indirect, and the risk they pose at the ecosystem-level.

Faculty Members with Expertise: Drs. Fei Wang and Mark Hanson.

Selection of Relevant Courses:

CHEM 2100	Organic Chemistry 1: Foundations of Organic Chemistry [(CHEM 1110) and (one of CHEM 1120, or CHEM 1126)] or (the former CHEM 1310)
CHEM 2110	Organic Chemistry 2: Foundations of Organic Synthesis (one of CHEM 2100 or the former CHEM 2210)
CHEM 2510	Introduction to Analytical Chemistry (CHEM 1110 and (one of CHEM 1120 or CHEM 1126)) or (the former CHEM 1310)
CHEM 2700	Biochemistry 1: Biomolecules and an Introduction to Metabolic Energy [(CHEM 1110) and (one of CHEM 1120 or CHEM 1126) or (the former CHEM 1310)] and [BIOL 1030]
CHEM 2710	Biochemistry 2: Catabolism, Synthesis, and Information Pathways [one of CHEM 2700, the former CHEM 2360, the former CHEM 2860, MBIO 2700, the former MBIO 2360] and [one of CHEM 2100, the former CHEM 2210]
CHEM 3500	Instrumental Analysis [(CHEM 2510) and (CHEM 2520)] or (the former CHEM 2470)
ENTM 4250	Pesticide Toxicology (A course in biochemistry)
SOIL 3520	Pesticides : Environment, Economics and Ethics
SOIL 3600	Soils and Landscapes in our Environment
SOIL 4130	Soil Chemistry and Mineralogy (SOIL 3600 or Permission of the Instructor)
SOIL 4400	Soil Ecology (AGEC 2370 or BIOL 2300 or SOIL 3600)
SOIL 4500	Remediation of Contaminated Land (SOIL 3600 or Permission of the Instructor)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

WATER RESOURCES

The study of water resources is gaining increasing attention as society recognizes the limitations that exist with this important renewable resource. Water resources are important to the environment generally in terms of being a critical factor in most biotic and abiotic processes. Ensuring a safe and healthy supply of water globally for human uses including household, agricultural, industrial, and recreational is the focus of this field of study. Careers in this area can be further explored through the ECO Canada website (www.eco.ca).

Faculty Members with Expertise: Drs. Mark Hanson, Fei Wang, Tim Papakyriakou, Gary Stern, Eric Collins, CJ Mundy, Alex Crawford, and Kristina Brown.

Selection of Relevant Courses:

ENVR 2180	Introductory Toxicology ((BIOL 1030 or HEAL 1502) and ((CHEM 1100 and CHEM 1120) or one of CHEM 1110 or CHEM 1130)) (also offered as BIOL 2380 and AGRI 2180)
ENVR 2550	Environmental Chemistry (also previously offered as CHEM 2550) (CHEM 1310 – see an advisor)
ENVR 3140	Aquatic Ecosystem Services (Department Head Approval, and 60 credit hours)
ENVR 3180	Methods in Ecotoxicology (ENVR 2180 or BIOL 2380 or AGRI 2180, or Instructor or Department Head)
ENVR 3250	Environmental Assessment (ABIZ 3550 or ENVR 3160 and AGEC 2370 or BIOL 2300 or BIOL 2390)
ENVR 4000 (T)	Advanced Topics in Ecosystem Services (when titled) (Department Head Approval)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Oceanography: Chemical (when titled) (Department Head Approval)
ENVR 4000 (T)	Water Resource Management (when titled) (Department Head Approval and 60 credit hours)
ENVR 4000 (T)	Winnipeg's Urban Nature (when titled) (Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Environmental Effects Monitoring (when titled) (Department Head Approval and 60 credit hours of university credit)
ENVR 4050	Ecosystem Management (Department Head Approval; also offered as GEOG 4050)
ENVR 4060	Biogeography (Department Head Approval; also offered as GEOG 4060)
ENVR 4180	Ecotoxicological Risk Characterization (ENVR 2180 or BIOL 2380 or AGRI 2180)
ENVR 4550	Aquatic Chemistry (ENVR 3550 or CHEM 3590 or Department Head Approval – see an advisor)
GEOG 2310	Introduction to Process Hydrology (GEOG 1290 and PHYS 1020 or PHYS 1050 or MATH 1500 or MATH 1510 or MATH 1520 or MATH 1530)
GEOG 2520	Geography of Natural Resources (3 credit hours of GEOG 1000 level)
GEOG 2540	Weather and Climate (3 credit hours of GEOG 1000 level)
GEOG 2870	Introduction to Economic Geography (3 credit hours of GEOG 1000 level)
GEOG 2930	Introduction to Oceanography (GEOG 1290 or ENVR 1000 or GEOL 1340)
GEOG 3920	Biological Oceanography (Instructor or Department Head Approval)
GEOG 4050	Ecosystem Management (Department Head Approval; also offered as ENVR 4050)
GEOG 4060	Biogeography (Department Head Approval; also offered as ENVR 4060)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
GEOG 4670 (T)	Winnipeg's Urban Nature (when titled) (Department Head Approval; also offered as ENVR 4000)
GEOG 4930	Chemical Oceanography (ENVR 2550 and GEOG 2930)
GEOG 4960	Biological Oceanography II: Higher Trophic Levels (GEOG 3920 and a 2000- level BIOL course)
GEOL 2390	Environmental Geology (Minimum 3 credit hours of university-level geology or GEOG 1290)

*See next page for additional courses in the **Water Resources** focus area.*
*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

WATER RESOURCES

The study of water resources is gaining increasing attention as society recognizes the limitations that exist with this important renewable resource. Water resources are important to the environment generally in terms of being a critical factor in most biotic and abiotic processes. Ensuring a safe and healthy supply of water globally for human uses including household, agricultural, industrial, and recreational is the focus of this field of study. Careers in this area can be further explored through the ECO Canada website (www.eco.ca).

Faculty Members with Expertise: Drs. Mark Hanson, Fei Wang, Tim Papakyriakou, Gary Stern, Eric Collins, CJ Mundy, Alex Crawford, and Kristina Brown.

Selection of Relevant Courses:

AGRI 2180	Introductory Toxicology ((BIOL 1030 or HEAL 1502) and ((CHEM 1100 and CHEM 1120) or one of CHEM 1110 or CHEM 1130)) (also offered as ENVR 2180 and BIOL 2380)
BIOL 2210	The Chordates (BIOL 1030)
BIOL 2260	Biology of Fungi and Lichens (BIOL 1030)
BIOL 2262	Biology of Algae (BIOL 1030)
BIOL 2380	Introductory Toxicology ((BIOL 1030 or HEAL 1502) and ((CHEM 1100 and CHEM 1120) or one of CHEM 1110 or CHEM 1130)) (also offered as ENVR 2180 and AGRI 2180)
BIOL 3370	Limnology (AGEC 2370 or BIOL 2300 or Permission of Department)
BIOL 3372	Wetland Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 4210	Biology of Fishes (BIOL 2210)
BIOL 4212	Systematics and Biogeography of Fishes (BIOL 2210 or BIOL 2231)
BIOL 4220	Marine Biodiversity (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 1000 or Permission of Department)
BIOL 4310	Application of Population Ecology in Fisheries and Wildlife (BIOL 3310)
BIOL 4312	Analysis of Biological Communities (AGEC 2370 or BIOL 2300 and one of STAT 1150 or STAT 2000)
BIOL 4374	Aquatic Botany (AGEC 2370 or BIOL 2300 and one of STAT 1150 or STAT 1000 or Permission of Department)
CHEM 3500	Instrumental Analysis (CHEM 2510) and (CHEM 2520)] or (the former CHEM 2470))
SOIL 3060	Introduction to Agrometeorology
SOIL 3520	Pesticides: Environment, Economics and Ethics
SOIL 3600	Soils and Landscapes in our Environment
SOIL 4060	Physical Properties of Soils (SOIL 3600 or BIOE 2110 or Permission of the Instructor)
SOIL 4500	Remediation of Contaminated Land (SOIL 3600 or Permission of the Instructor)
SOIL 4510	Soil and Water Management (SOIL 3600)
SOIL 4520	Soil Fertility (SOIL 3600)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

WILDLIFE MANAGEMENT

Wildlife and ecosystem management continue to be dynamic and emerging fields in environmental science and studies. Wildlife management is the science and art of changing characteristics and interactions be- tween animal populations, habitats, and humans to achieve specific societal goals. Ecosystem management addresses societal objectives for the broader consideration of all biological and abiotic components and their interacting processes in a defined geographical area. Both areas of study focus on reducing the loss of biological diversity. The Wildlife Society website (www.wildlife.org) provides additional details on career prospects and course requirements for Certification in these fields.

Faculty Members with Expertise: Drs. David Walker, Michael Campbell, and Lisa Loseto.

Selection of Relevant Courses:

ENVR 3000 (T)	Environment and Tourism (when titled) (Department Head Approval; also offered as GEOG 3770)
ENVR 3020 (T)	Environmental Science Field Investigations (when titled) (Department Head Approval)
ENVR 3250	Environmental Assessment (ABIZ 3550 or ENVR 3160 and AGEC 2370 or BIOL 2300 or BIOL 2390)
ENVR 3850	Sustainable Manitoba (60 credit hours or Department Head Approval; also offered as GEOG 3850)
ENVR 4000 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as GEOG 4670)
ENVR 4000 (T)	Human Dimensions of Wildlife (when titled) (Department Head Approval; also offered as GEOG 4670)
ENVR 4020 (T)	Environmental Science Field Investigation (when titled) (Department Head Approval)
ENVR 4050	Ecosystem Management (Department Head Approval; also offered as GEOG 4050)
ENVR 4060	Biogeography (Department Head Approval; also offered as GEOG 4060)
ENVR 4850	Wildlife Management (Permission of Instructor)
GEOG 3770 (T)	Environment and Tourism (when titled) (Department Head Approval; also offered as ENVR 3000)
GEOG 3850	Sustainable Manitoba (60 credit hours or Department Head Approval; also offered as ENVR 3850)
GEOG 3860	Animal Geographies (Department Head Approval)
GEOG 4050	Ecosystem Management (Department Head Approval; also offered as ENVR 4050)
GEOG 4060	Biogeography (Department Head Approval; also offered as ENVR 4060)
GEOG 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as REC 4350)
GEOG 4670 (T)	Human Dimensions of Wildlife (Department Head Approval)
GEOG 4670 (T)	Field Course in Ship-Based Sampling Techniques (when titled) (Instructor or Department Head Approval; also offered as ENVR 4000)
BIOL 2200	The Invertebrates (BIOL 1030)
BIOL 2210	The Chordates (BIOL 1030)
BIOL 2242	The Flowering Plants (BIOL 1030)
BIOL 2260	Biology of Fungi and Lichens (BIOL 1030)
BIOL 2262	Biology of Algae (BIOL 1030)
BIOL 2500	Genetics 1 (BIOL 1030)
BIOL 3242	Vascular Flora of Manitoba (BIOL 2240 or BIOL 2242 or Permission of Department)
BIOL 3280	Forest Botany (BIOL 2242 (C); and one of BIOL 2300 or AGEC 2370 (C) or Permission of Department)
BIOL 3310	Foundations of Population Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 2000 or Permission of Department)
BIOL 3312	Community Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 2000 or AGRI 2400 or Permission of Department)
BIOL 3314	Field Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 2000 or Permission of Department)
BIOL 3318	Boreal Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)

*See next page for additional courses in the **Wildlife Management** focus area.*

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

WILDLIFE MANAGEMENT

Wildlife and ecosystem management continue to be dynamic and emerging fields in environmental science and studies. Wildlife management is the science and art of changing characteristics and interactions be- tween animal populations, habitats, and humans to achieve specific societal goals. Ecosystem management addresses societal objectives for the broader consideration of all biological and abiotic components and their interacting processes in a defined geographical area. Both areas of study focus on reducing the loss of biological diversity. The Wildlife Society website (www.wildlife.org) provides additional details on career prospects and course requirements for Certification in these fields.

Faculty Members with Expertise: Drs. David Walker, Michael Campbell, and Lisa Loseto.

Selection of Relevant Courses:

BIOL 3350	Methods of Data Collection and Analysis in Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 2000 or Permission of Department
BIOL 3360	Animal Behaviour (AGEC 2370 or BIOL 2300; and BIOL 2210; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3372	Wetland Ecology (AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 3600	Biological Diversity and Sustainability (AGEC 2370 or BIOL 2300 or BIOL 1030 and BIOL 2390; and one of STAT 1150, STAT 1000)
BIOL 4210	Biology of Fishes (BIOL 2210)
BIOL 4212	Systematics and Biogeography of Fishes (BIOL 2210 or BIOL 2231 or Permission of Department)
BIOL 4214	Biology of Amphibians and Reptiles (BIOL 2210 or Permission of Department)
BIOL 4216	Biology of Birds (BIOL 2210)
BIOL 4218	Biology of Mammals (BIOL 2210 and AGEC 2370 or BIOL 2300; and one of STAT 1150, STAT 1000 or Permission of Department)
BIOL 4220	Marine Biodiversity (AGEC 2370 or BIOL 2300; and one of STAT 1150 or STAT 1000 or Permission of Department)
BIOL 4262	Wildlife and Fisheries Parasitology (BIOL 3270)
BIOL 4310	Application of Population Ecology in Fisheries and Wildlife (BIOL 3310)
REC 4350	Parks and Protected Areas Planning and Management: Field Studies (6) (Department Head Approval; also offered as GEOG 1350)
SOIL 3600	Soils and Landscapes in our Environment
SOIL 4060	Physical Properties of Soils (SOIL 3600 or BIOE 2110 or Permission of the Instructor)
SOIL 4500	Remediation of Contaminated Land (SOIL 3600 or Permission of the Instructor)
SOIL 4510	Soil and Water Management (SOIL 3600)

*Note: This list also includes **Courses Applicable to all Focus Areas**, as detailed on page 3.*

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