

BIOLOGY 228.3 Q1
An Introduction to Ecology and Ecosystems
Summer Session, May 4th – 25th, 2016
(Lecture: Rm. 125 Biology, 8:30 – 10:50 am)

Instructor: Professor D. Lehmkuhl, Office 241 Biology, Telephone: 966-
Instructor Lab: Scott Halpin Room 150

Text: **Elements of Ecology**
Smith, R. L. and T. M. Smith And Irene Waters , Canadian Ed.
Lab: 1:30 -5:30, Rm 212 Biology

Fieldtrips: **May 19th Beaver Creek All Day Trip**
Hat, rain gear, good shoes, long pants recommended, food, water, sun
screen, insect repellent. Optional: binoculars, field guides to plants and
animals.

Evaluation: Midterm exam.....20% May 16th
 Laboratory.....40%
 Final Exam.....40% May 27th or 28th

Important Dates:

- **May 4th – First Lecture**
- **May 16th – Midterm Lecture Exam**
- **May 19th – Beaver Creek All Day Field Trip**
- **May 23rd – Victoria Day (no classes)**
- **May 25th – Last Day of Lecture**
- **May 27th or 28th – Final Lecture Exam**

University Policy requires attendance of all lectures. Written excuses are required for absences. Students with disabilities are encouraged to self-identify and provide documentation at the earliest possible time so that appropriate measures may be arranged

All suspected incidences of cheating/academic dishonesty will automatically be forwarded to the Academic Dishonesty Committee of the College of Arts and Science for assessment and action.

All students are expected to review the Guidelines for Academic Conduct and associated documents posted at http://www.usask.ca/university_secretary/honesty/. These guidelines are set by the University Council and individual colleges may have additional regulations which are in addition to, but consistent with, those of the university council.

Missed Examinations:

In the event of a missed midterm or lab quiz/exam the student is required to contact the instructor within 3 working days IN PERSON or by telephone (email is not acceptable). Supporting documentation for exceptional circumstances (illness, bereavement etc.) must be supplied in order for consideration of deferred testing to proceed. Failure to comply will result in a mark of zero.

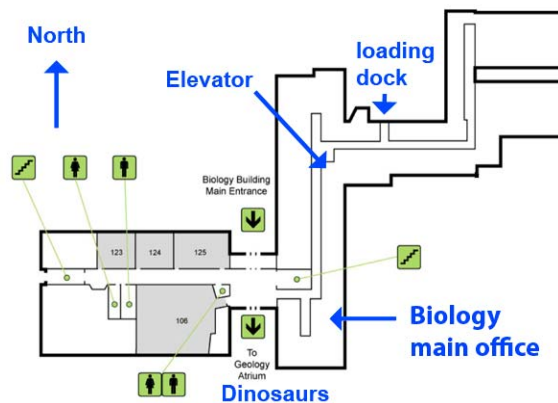
In the event of a missed Final Exam, college guidelines apply and the student must apply to the Dean's Office of the college in which he/she is registered. The application for a deferred Final Exam must be filed within 3 working days of the scheduled Final Exam. Supporting documentation for exceptional circumstances (illness, bereavement etc.) must be supplied in order for consideration of deferred testing to proceed. Failure to comply will result in a mark of zero.

Email Policy:

Questions relating to explanations of course content are best asked after class or during lab periods. Instructors reserve the right to answer emails at their discretion.

Special Needs or Disabilities:

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Disability Services for Students (DSS) if they have not already done so. Students who suspect they may have disabilities should contact DSS for advice and referrals. In order to access DSS programs and supports, students must follow DSS policy and procedures. For more information, check <http://students.usask.ca/disability/>, or contact DSS at 966-7273 or dss@usask.ca. Students registered with DSS may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through DSS by stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by DSS.



Students requiring an elevator for access to the second floor in the Biology Building (teaching labs and some faculty offices) may use the elevator in the Museum of Natural Sciences. Alternatively, or if offices on the 3rd floor of the Biology Building need to be accessed, there is an elevator located at the north end of the research wing, opposite Room 130.

Integrity Defined (from the Office of the University Secretary)

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Website and avoid any behaviour that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students should be familiar with the Regulations on Academic Student Misconduct http://www.usask.ca/secretariat/student-conduct_appeals/StudentAcademicMisconduct.pdf as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (http://www.usask.ca/university_secretary/honesty/StudentNonAcademicMisconduct2012.pdf)

For more information on what academic integrity means for students see the Student Conduct & Appeals section of the University
<http://www.usask.ca/secretariat/student-conduct-appeals/academic-misconduct.php>

Description and Course Objectives:

This course is designed for undergraduate students that have an interest in broadening their studies in biology, however, we encourage students from a variety of departments to take this course because the principles of ecology cross several disciplines with the Colleges of Arts and Science, Agriculture, and Veterinary Medicine.

Major topics include: An introduction to ecological principles and the functioning of aquatic and terrestrial ecosystems; individual-based ecology, including behavior; population dynamics; community structure and dynamics; ecosystem production; energy flow and material recycling; and conservation biology. Your instructors have expertise in aquatic ecosystem ecology, vegetation ecology and field data collection methods for terrestrial and aquatic systems.

Learning Objectives:

Through lectures, assigned readings, and laboratory exercises students will:

- Develop an introductory understanding of ecology. This understanding will be in 4 major ecological sub-disciplines: population, community, ecosystem and global ecology.
- Be able to describe how the scientific methods is applied in examples of ecological studies.
- Practice and apply numerical skills by compiling, summarizing and interpreting basic scientific data.
- Build critical thinking skills through the process of evaluation scientific information in Biol 228 laboratories and lectures and from the literature.
- Become familiar with the impacts of humans on ecological systems.
- Be able to describe mechanisms that support biological diversity at the individual, community, landscape, and global scales.
- Develop a sense of place by acquiring new knowledge about the ecology of populations, communities and ecosystems of Saskatchewan and Canada

Prerequisites:

BIOL 121 or GEOG 120 or 6 credit units in GEOL. Students with credit for BIOL253 or PLSC 213 will not receive credit for BIOL228.

LECTURE SCHEDULE

Suggested pages and chapters, but not limited to the below. See also text index and table of contents.

May 4-6th and 9th

- Introduction definitions of ecology , the scientific method history of ecology, branches of ecology See text preface and Ch. 1
- Community Ecology, biodiversity, definition and significance of communities, properties of communities, density, diversity, stability, succession, niche, habitat, competition. Landscape ecology, definitions, concepts, applications Saskatchewan communities.. (Text, Part 5, Chapters 16-18)

May 10th

- All day field trip, Saskatchewan River - Saskatchewan and local ecosystems.
- Community ecology continued, begin global ecology. (Text Ch. 2 and Ch. 16,18 & 19)
- Global ecology, atmosphere, water, plate tectonics, origin of ocean basins, mountains, deep ocean trenches. (Text Ch. 2)

May 11th – 13th

- Biogeochemical cycles, carbon cycle: Where is carbon and what is it doing; Greenhouse effect, nitrogen, phosphorus, sulfur cycles, human impacts on cycles, eutrophication, soil fertility, acid rain, other types of pollution, environmental degradation. (Text Part 6, Ch. 19-22; Ch. 28)
- Catch-up or get ahead lecture

MIDTERM EXAM – May 16th

- Compare and contrast energy flow with cycles of materials. Laws of Thermodynamics, primary productivity, secondary productivity, efficiencies in ecological systems, pyramids, grazing and detrital food chains, ecological pyramids and bioconcentration. (Part . Ch. 20-21)
- Population ecology, population growth, age structure, survivorship, human populations. (Text , Part 3)

May 17th – 25th (May 23rd is Victoria Day No Class)

- Introduction to terrestrial ecosystems and biomes, soils, some major world soil types, properties of water, pH, buffer systems, significance to biosphere. (Ch. 3,4 and 23)
- Aquatic Systems: Freshwater lakes, thermal stratification, oxidized microzone; Streams, Rivers, Continuum Concept, reservoirs (rivers converted to lakes). Physical and Biological consequences, especially noting the situation in Saskatchewan, e.g., Gardiner Dam. (Ch.24)
- Marine Systems: Significance and major feature of each, especially in relation to cycles, productivity, and unique features.

• LAB FINAL MAY 25th

- **FINAL EXAM: see website for exam date May 27 or May 28**
(<http://students.usask.ca/current/academics/exams/spring-summer.php>)

Laboratory Schedule, 2016 Summer Q1

Date	LAB
MAY 5	Quantitative Vegetation Sampling Methods*
MAY 6	Statistical Analysis of Data; The X^2 Test*
MAY 9	An Investigation of Population Growth I: Exponential Growth Models*
MAY 10	An Investigation of Logistic Growth Models* Quiz 1: Sampling Methods and X^2 labs
MAY 11	Energy Flow and Materials Distribution in Terrestrial Systems*
MAY 12	Energy Flow and Materials Distribution in Aquatic Systems* Quiz 2: Population Growth
MAY 13	<u>NO LAB</u>
MAY 16	<u>NO LAB</u>
MAY 17	Measuring Communities: Diversity, Dominance, and Community Similarity*
MAY 18	Saskatchewan Riverbank Fieldtrip* Quiz 3: Energy Flow
MAY 19	Beaver Creek Field Trip; An Introduction to Saskatchewan Ecosystems (note all day 8:30 to 5:20)
MAY 20	<u>NO LAB</u>
MAY 23	<u>NO LAB</u>
MAY 24	REVIEW LAB
MAY 25	<u>FINAL LAB EXAM 1:30 to 3:30 pm</u>

* denotes labs with in-lab assignments

LABORATORY: Room 212 Biology, 1:30-5:20 pm

Lab expectations and evaluation/assignment requirements will be discussed in the first lab period.