



UNIVERSITY OF
ALBERTA



REN R 463

BIOLOGICAL ADAPTATION TO NORTHERN ENVIRONMENTS

In Winter 2015, REN R 463, *Biological Adaptation to Northern Environments*, is being offered at Yukon College as part of the Northern Environmental and Conservation Sciences, B.Sc. Program. All students registered in REN R 463 must adhere to the requirements outlined in this course syllabus. University of Alberta students must also be aware of, and adhere to, the University's Code of Student Behaviour, referenced in the outline.

INSTRUCTOR:	DR. KATHRYN AITKEN Adjunct Professor, Dept. of Renewable Resources, U of Alberta, and Instructor/Coordinator, Northern Environmental and Conservation Sciences Program, Yukon College
OFFICE HOURS:	Wednesdays, 10:30-12:00 (or by appointment)
OFFICE LOCATION:	A2509
E-MAIL:	kaitken@yukoncollege.yk.ca

CLASS DAYS & TIMES: Tuesdays and Thursdays, 10:30-12:00

CLASS LOCATION: A2204

COURSE DESCRIPTION:

This course will provide an overview of the study of evolutionary processes, with a focus on examples from northern environments. Topics from evolutionary biology, such as natural selection and adaptation, will be applied to species living in boreal, arctic, and tundra environments. The course will cover the unique challenges faced by animals and plants in these environments, the ways in which they have adapted to deal with these conditions, and the potential effects of climate change on northern species.

STUDENT LEARNING OUTCOMES AND COMPETENCIES:

Upon successful completion of this course, students will:

- Understand the mechanisms of evolution, at a variety of scales.
- Be familiar with the application of concepts and models in evolutionary biology to conservation and management in northern environments.
- Be able to use evolutionary concepts such as natural selection and adaptation to explain the ways in which northern plants and animals may be affected by climate change.

COURSE FORMAT (3-0-0):

The course consists of two 1.5-hour lectures per week.

Audio or video recording of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as part of an approved accommodation plan. Recorded material is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the instructor.

COURSE PREREQUISITES AND/OR CO-REQUISITES:

Registration in University of Alberta/Yukon College B.Sc. in Environmental and Conservation Sciences degree program, and successful completion of U of A BIOL 208, YC BIOL 220 or an equivalent second-year ecology course, or permission of the instructor.

REQUIRED TEXTBOOKS/MATERIALS:

Futuyma, Douglas J. 2013. Evolution, 3rd ed. Sinauer Associates, Inc. ISBN 978-1-60535-115-5. Available in the YC Bookstore; also available as an ebook through CourseSmart (<http://www.coursemart.com/9781605351155>), and as a loose-leaf edition through several online sources.

COURSE WEBSITE

Much of the material for the course will be available on the REN R 463 class site on MyYC. Lectures, announcements, additional reading, and other material will be available there for download or viewing. Students must ensure that they have a valid Yukon College student computing account. Information on setting up a MyYC account is available at:

http://www.yukoncollege.yk.ca/student_info/pages/computing_services.

UNIVERSITY OF ALBERTA ACADEMIC INTEGRITY AND CODE OF STUDENT BEHAVIOUR

Plagiarism and Cheating

The University of Alberta is committed to highest standards of academic integrity and honesty. Students must be familiar with standards regarding academic honesty and uphold policies of the University. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students at the University of Alberta are subject to the Code of Student Behaviour, as outlined in the 2014/2015 University Calendar. Students should familiarize themselves with the current version of the code and ensure they do not participate in any inappropriate behaviour as defined by it. Key components of the code specific to this course include the following statements. **Plagiarism:** no student shall submit the words, ideas, images or data of another person as the student's own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study. **Cheating:** no student shall represent another's substantial editorial or compositional assistance on an assignment as the student's own work. The most recent version of the Code of Student Behaviour can be found on line on the University of Alberta web site.

Students should speak with the course instructor about any questions or concerns about the code. Students should be particularly aware of the code as it pertains to internet and library research, use of previous class notes, reclamation plans of former students and interviews or discussions with others.

PROFESSIONALISM AND CLASSROOM RULES OF ENGAGEMENT

Students are expected to attend all lectures, be engaged and courteous in all course activities, and to be on time for class. Please do not use cell phones during class. Laptops are permitted for note taking and in-class work; however, please do not use laptops in class for non-class-related activities.

COURSE REQUIREMENTS/EVALUATION:

Assignments

Students will write a short species account describing the adaptations of a species (or group of species) to life in northern environments, and present these results orally during class. Please discuss your topic ideas with the instructor. The written account will be due on Mar 24, and oral presentations will be conducted on Mar 31 and Apr 2. Detailed instructions on length and format for the written report and oral presentation will be given in class.

Students must adhere to the citation style used by the Council of Science Editors in all written assignments (http://library.yukoncollege.yk.ca/help/pages/citation_style_guides).

Unless otherwise specified, assignments are due by 11:59 pm local time on the date that they are due. Late assignments will lose 5% of their mark per day that they are late.

Exams

There will be two midterm exams and one comprehensive final exam. The midterm exams will be scheduled during class time on Feb 3 and Mar 3. The final examination will be held at the end of term, during the scheduled Yukon College exam period.

Evaluation

The course grade will be determined as follows:

Assignment	Percent
Midterm exam #1 (Feb 3)	20%
Midterm exam #2 (Mar 3)	20%
Species account (due Mar 24)	15%
Oral presentation (Mar 31 and Apr 2)	15%
Final exam (during exam period)	30%

ACADEMIC ACCOMMODATION:

Reasonable accommodations are available for students with a documented disability or chronic condition. It is the student's responsibility to seek these accommodations. If a student has a disability or chronic condition and may need accommodation to fully participate in this class, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or lassist@yukoncollege.yk.ca.

YUKON COLLEGE WRITING CENTRE:

All students are encouraged to make the Writing Centre a regular part of the writing process for coursework. Located in C2231 (adjacent the College Library), the Writing Centre offers half-hour writing

coaching sessions to students of all writing abilities. Coaching sessions are available in person and through distance technologies (e.g., email plus Skype or phone). For further information or to book an appointment, visit the Centre's website: www.yukoncollege.yk.ca/student_info/pages/writing_centre.

TOPICS:

- What is evolution?
- Patterns of evolution; adaptive radiation
- History of life on Earth
- Geography of evolution
- Genetic and phenotypic variation
- Natural selection
- Evolution of life histories
- Sexual selection
- Species and speciation
- Coevolution
- Plant adaptations in the north
- Animal adaptations in the north
- Climate change and adaptation