

COURSE SYLLABUS

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| COURSE TITLE: | Life in the North | TERM: | T2 |
| COURSE CODE: | BIOL 314 | DELIVERY: | 2015-16 |
| COURSE CREDITS: | 3 CU | CLASS TIME: | Thursdays (7-9:50 pm) and Saturdays (8:30-4:30 pm with a 1 hr break for lunch) |
| CLASS SECTION: | 1 section | START DATE: | 8 January 2016 |
| CLASS LOCATION: | Biology, room 202 | | |
| WEBSITE: | Course website on BlackBoard | | |

Course Description

An exploration of the natural history of organisms living in cold, northern environments. Topics focus on the special characteristics of northern environments and how organisms have adapted to life in those environments. Activities incorporate scientific and Indigenous knowledge of ecology, animal behavior, and human relationships with life in the North.

Prerequisites

BIOL 121 and at least one of the following: BIOL 228, PLSC 213, INDG 241, GEOG 280.

Note: BIOL 314 is delivered over the course of four weeks spaced out during the regular term. Students need to make themselves available for all of the scheduled course times and should consult with the Department of Biology in advance of registering for this course. Students may receive credit for only one of BIOL 312 or BIOL 314.

Learning Outcomes

By the completion of this course, students will be expected to:

- (1) Record and interpret environmental conditions and organism behavior and adaptations through first-hand observations in outdoor winter environments;
- (2) Draw on multiple perspectives of scientific and Indigenous knowledge for understanding organisms and their behavior, adaptations, and ecology;
- (3) Build personal familiarity of taxonomic groups of northern organisms (e.g. birds, mammals, fish, plants), their ecology, and traditional uses through a combination of research and first-hand experience;
- (4) Develop a sense of curiosity and wonder about northern ecosystems and organisms; and
- (5) Communicate their knowledge and process of discovery through the development of written or multi-media educational materials.

Course Overview

“Life in the North” is a Biology course that honors multiple ways of knowing about organisms and their ecology, including insights from western science and Indigenous knowledge. The course focuses on the natural history of organisms living in cold, northern environments. We will consider the special characteristics of northern environments and the unique and diverse ways that organisms have adapted to life in those environments. Hands-on, experiential learning activities in locations in the vicinity of Saskatoon will provide opportunities to observe and explore how life copes and thrives within the stressful constraints of cold environments. Where possible, experiential activities will include interactions with local knowledge holders, Elders, and scientists. Student research projects will incorporate different perspectives on and knowledge of the ecology, behavior, and human relationships with life in the North.

Instructor Information

Contact Information

Dr. Jill Johnstone
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Phone: 966-4421

Office Hours

By appointment

Instructor Profile

See <http://artsandscience.usask.ca/profile/JJohnstone> and <http://npelusask.weebly.com/>

Required Resources

Readings/Textbooks

Readings will be assigned from the books below. Copies will be on reserve in the Natural Sciences library at U of S, and at the La Ronge campus library.

- Life in the Cold, 4th edition, by Peter Marchand (2013)

Electronic Resources (to be purchased by each student)

- BBC video series, Frozen Planet (2011). These are available for purchase and download from iTunes, Netflix, or other retailers.

Other Required Materials

- A field notebook suitable for outdoor use is required for this class.
- Students will also need appropriate clothing and footwear for outdoor field trips, including the possibility of air temperatures below -30 C. Due to the difficulty of rescheduling Saturday classes, field trips will proceed regardless of weather conditions.

Downloads

- Canada National Film Board and other online videos

Supplementary Resources

Students are encouraged to make use of supplementary resources from the web, library holdings, and local resources that they are aware of. Resources deriving from both scientific and aboriginal knowledge traditions will be considered valid sources of knowledge to be drawn on for student work. Excellent resources to consult include:

- Mammal Tracks and Sign, by Mark Elbroch (2003)
- The World of Northern Evergreens, by E.C. Pielou (2011)
- The Boreal Herbal, by Bev Gray (2015)
- Aboriginal Plant Use in Canada's Northwest Boreal Forest, by Robin Marles et al. (2000)

Class Schedule

The course will meet four times on Thursday evenings and Saturday days during the term for experiential activities. Please see the tentative class schedule below. Changes and updates to the class schedule will be posted on the course BlackBoard website.

| Module Weeks | Module Topic | Self Directed Learning | Course Activities & Assignments Due |
|--------------|-----------------------|--|---|
| 1 | Introduction | <p><u>Video</u>: Frozen Planet, Vol. 1 (BBC)</p> <p><u>Reading</u>: LC* Chap. 1 (Winter Paths)</p> | |
| 2 | Northern environments | <p><u>Video</u>: Hypothermia and cold injuries; Frozen Planet, Vol. 5 (Winter)</p> <p><u>Reading</u>: LC Chap. 2 (Changing Snowpack)</p> | <p>Thursday evening: Jan. 12</p> <p>Safe practices for winter field work; Traditional uses of northern plants (3 hrs)</p> <p>Saturday day: Jan. 14</p> <p>Morning: Tree identification & dichotomous keys (3 hrs)</p> <p>Afternoon: Biochemistry & medicinal plants (3.5 hrs)</p> |
| 3 | Plants | <p><u>Video</u>: TBD (Boreal Forest)</p> <p><u>Reading</u>: LC Chap. 3 (Plants & Winter)</p> | <p><u>Reflection Exercise #1</u>: Plant adaptations (due Jan. 22)</p> <p><i>Self-directed</i>: Plant identification & research (6 hrs total in this module)</p> |
| 4 | Plants | <p><u>Video</u>: Frozen Planet, Vol. 2 (Spring)</p> <p><u>Reading</u>: LC Chap 6 (Plant-Animal Interactions)</p> | <p><i>Self-directed</i>: complete plant ID & research exercises</p> <p><u>Research Assignment</u>: Northern Plants (due Jan. 29)</p> |

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| 5 | Animals | <p><u>Video</u>: The Happy Trapper or Isuma Productions "Nunavut" Episode 6 (Stalking)</p> <p><u>Reading</u>: LC Chap 4 (Animals & Winter)</p> | <p>Thursday evening: Feb. 2</p> <p>Staying warm in winter (animals and people) (3 hrs)</p> <p>Saturday day: Feb. 4</p> <p>Snow measurement and winter tracking (Note: the timing for this class will extend into the evening in order to complete small mammal trapping activities.)</p> |
| 6 | Mammals | <p><u>Video</u>: Frozen Planet, Vol. 3 (Summer)</p> <p><u>Reading</u>: LC Chap 8 (Humans in Cold Places)</p> | <p><u>Reflection Exercise #2</u>: Staying warm in winter (due Feb. 12)</p> <p><i>Self-directed</i>: tracking exercise (6 hrs total in this module)</p> |
| 7 | Mammals | <p><u>Video</u>: Being Caribou (NFB)</p> <p><u>Reading</u>: TBD</p> | <p><i>Self-directed</i>: complete tracking exercise</p> <p><u>Research Assignment</u>: Tracking assignment (due Mar. 2 before class)</p> |
| | - Reading Week | - Reading Week - | |
| 8 | Birds | <p><u>Video</u>: Frozen Planet, Vol. 4 (Autumn)</p> <p><u>Reading</u>: LC Chap 7 (Winter Profiles), esp. part 3 (Gallinaceous Birds)</p> | <p>Thursday evening: Mar. 2</p> <p>Bird adaptations to cold (3 hrs)</p> <p>Saturday day: Mar. 4</p> <p>Bird observations & feeder experiment (7 hrs)</p> |
| 9 | Birds | <p><u>Video</u>: Winged Migration</p> <p><u>Reading</u>: TBD</p> | <p><u>Reflection Exercise #3</u>: Seasonal migrations (due Mar. 12)</p> <p><i>Self-directed</i>: bird observation study (6 hrs total in this module)</p> |
| 11 | Climate Change | <p><u>Video</u>: Frozen Planet, Vol. 7 (On thin ice)</p> <p><u>Reading</u>: LC Chap 9. (Changing snowpack)</p> | <p><i>Self-directed</i>: analysis of bird observations</p> <p><u>Research Assignment</u>: Bird observations study (due Mar. 19)</p> |
| 12 | Climate Change | <p><u>Video</u>: Isuma TV – Inuit Knowledge and Climate change</p> | <p>Thursday evening: Mar. 23</p> <p>Aboriginal perspectives on climate change (3 hrs)</p> <p>Saturday day: Mar. 25</p> <p>Climate change research: using resources and gathering information from different perspectives (7 hrs)</p> |
| 13 | | | <p><u>Research Assignment</u>: Climate change</p> |

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| | Course wrap-up | | (due by Apr. 9) |
| | Final Examination | Open book, open note, essay-style exam covers any of the material examined in the course. | <u>On-line exam</u> to be taken during April exam period |

*LC = Life in the Cold (by Peter Marchand)

Final Examination Scheduling

The final examination for this course will be administered online and must be written within the date specified in the course schedule. There is no mid-term examination for this course.

Grading Scheme

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| Participation mark | 15% |
| Reflection exercises (3) | 15% |
| Research assignments (4) | 40% |
| Final exam | 30% |
| Total | 100% |

Evaluation Components

Participation

Value: 15% of final grade

Due Date: Assessed over the course of the term

Type: Students will receive a mark based on their participation in experiential activities, including outdoor field trips, lab activities, and discussion groups.

Description: Participation requires attendance and participation in experiential activities scheduled for Thursday evenings (7-10 pm) and Saturday days (8:30-4:30 pm, morning and afternoon each counted separately for participation). A passing mark for participation may be obtained by simply being present at all of the scheduled activities. Full marks will be given for active participation, including direct involvement in taking measurements and other physical activities, asking questions, and voicing opinions and ideas during discussions. Absence from any scheduled experiential activities, without a make-up plan approved by the instructor, will automatically result in the loss of 1/15 participation marks. **Students will not receive credit for the course if they miss more than 3 scheduled experiential activities.**

Reflection Exercises (3 individual assignments)

Value: 15% of final grade (5% each)

Due Dates: See Course Schedule

Type: Students will receive a mark of up to 5 course percentage points for each reflection exercise, based on their observations and interpretations of resource materials covered outside of class meetings.

Description: Reflection assignments are a means to engage students in critical thinking, reflection, and inquiry based on assigned readings and video materials. Students will review readings and video materials out of class, and then identify two topics of particular personal interest to them that arise from the materials and are relevant to the general themes of “Life in the North.” For each topic, students will write down a research question that characterizes their curiosity and interest in the topic. Students will then spend one-two hours gathering information on each topic, using resources from internet, and text-based summaries of Indigenous knowledge and scientific research. For the submitted written assignment, students are asked to write out the research question for each topic, and summarize the results of their research in a written paragraph that describes what they have learned, why they think it is important or interesting, and what new questions they would follow up on if they had additional time.

Research Assignments (4 individual assignments)

Research Assignment 1: Northern plant identification and use

Value: 10% of final grade

Due Date: See Course Schedule

Type: Students collect samples and notes in the field describing characteristics and uses of northern plants.

Description: For this assignment, students will take notes of natural history observations while participating in activities related to identification of northern plants. We will work with plant specimens collected ahead of time, as well as using local examples of northern trees and shrubs growing around the U of S campus area. Students will observe and sketch plant samples, making notes about characteristic features. Building from these notes, students will work in small groups to create dichotomous keys for winter identification of local species. Students will be given pressed samples of northern plants collected in the summer to identify in the lab. These samples will be the basis for further research into known traditional uses of two plant species found in the North. Students will then use the scientific literature to search for information on plant characteristics (structure, chemistry, distributions) that support those uses. Information will be compiled into a short report that includes identification information for each of the three plants, along with English, scientific, and aboriginal plant names, and summarizes the type of traditional uses researched and how those relate to the physical attributes of the plants.

Research Assignment 2: Tracking and mammal behaviour

Value: 10% of final grade

Due Date: See Course Schedule

Type: Students develop tracking skills and understanding of animal behavior by following and videotaping a set of animal tracks in a natural setting.

Description: The assignment consists of analyzing data collected by the class on animal tracks and independent work to collect and interpret video footage of a set of wild animal tracks in a natural setting. Assignment activities build off group training in observation and interpretation of animal tracks during scheduled class activities. Following this initial training, students are expected to work independently or in small groups to collect and compile images of animal tracks into a short video with a written or recorded interpretation of the animal's activities that formed the tracks. Interpretation should include the identity of the animal (including English, scientific, and aboriginal plant names), an estimate of when the tracks were made, and interpretation of what the animal was doing that draws on evidence from the tracks themselves and knowledge of the ecology of that animal. Each student is required to submit footage on a

unique set of tracks, along with their interpretation of that animal's behaviour. Students will also summarize records of tracks collected during class activities.

Research Assignment 3: Bird observations

Value: 10% of final grade

Due Date: See Course Schedule

Type: Students collect notes in the field describing observations bird feeding and activities based on the field lab.

Description: For this assignment, students will collect observations of bird feeding and behavior following an initial field lab setting up a bird feeder study in the area around the U of S campus. Training in making observations and recording field notes will be part of the scheduled field lab. Students will then be assigned the collection of personal field notes of bird observations that include standard background information about the location, time, and environmental conditions, as well as notes on specific observations of bird identity and behaviour. Sketches, photographs, video clips, and other forms of records are encouraged in addition to written notes. Students will review their notes after returning from the field and supplement their field observations with research on the distribution and ecology (habitat use, food sources, migration information) of two observed species, based on research on internet and text-based summaries of Indigenous knowledge, and scientific research. The submitted assignment will include a scanned copy of field notes as well a short report that includes information for three bird species, including with English, scientific, and aboriginal names, a summary of field observations, and information on the species distribution, ecology, and significance to local people.

Research Assignment 4: Climate change

Value: 10% of final grade

Date: See Course Schedule

Type: Students develop info-graphic or multi-media projects that can be used to educate the public about climate change impacts on the North.

Description: Students will work together in small groups during scheduled class activities at the end of term to research science and Indigenous perspectives of climate change impacts in the North. The students will then design and construct a project to summarize this information in a way that gets their message across to a public audience about climate change. The idea behind this project is to engage students' creative abilities to communicate information and perspectives on climate change that are relevant to the North. One aspect of the research project will be searching out venues for communicating the project outcomes to the public, via the internet, printed media, or public installations. The precise structure of the project outcomes will be tailored to the venue for distribution.

Final Exam

Value: 30% of final grade

Date: See Course Schedule

Length: 3-5 hours

Type: On-line, open-book exam

Description: The final exam will be administered in an on-line format that can be taken at any time during one of the scheduled weeks of the U of S final examination period. Questions will contain a mixture of short answer (based on content covered in class readings, videos, and group activities) and essay questions where students are invited to reflect on broader course content. Exam questions will aim to assess a student's ability to integrate information drawn from different parts of the course, and to utilize elements of both scientific and Indigenous knowledge in developing their responses. Knowledge of the ecology, behavior, and adaptations

of northern organisms will also be assessed through the exam questions. Questions in each individual exam will be randomly selected from a broader set of questions, so that no 2 students will take precisely the same exam. The exam is open-book; once the on-line examination is started, the student has up to 3 hours to complete the questions and submit answers.

Submitting Assignments

Assignments will be submitted electronically through the course website. Specific due dates and times will be specified in the detailed course schedule provided at the start of the class.

Late Assignments

Late assignments will be accepted for up to 3 calendar days following the scheduled due date, with a penalty of 1% of the final course mark assigned for each day late (1 day = 24 hours). For example, the potential mark for a reflection assignment is 4 percentage points of the final course mark; an assignment submitted 2 days late would have a maximum possible score of 2 percentage points. Similarly, a research assignment that is allocated 10 percentage points of the final course mark would have a maximum possible score of 8 percentage points if submitted 2 days late. Assignments will not be accepted more than 3 days after the due date, and a zero mark will be assigned.

Criteria That Must Be Met to Pass

Completion of the final exam and participation in scheduled experiential activities are required as part of the course. Students missing more than 3 of the scheduled experiential activities will not be given credit for completing the course.

Attendance Expectations

Participation in scheduled experiential activities is required as part of the course. Experiential activities are scheduled for Thursday evenings (1 session; 7-10 pm) and Saturday days (2 sessions of 3-4 hours each, typically held from 8:30 am to 12 pm and 1:00 to 4:30 pm), as outlined in the course schedule. In the event that it is necessary for a student to miss an experiential session, arrangements may be made with instructor to identify an independent set of experiential work that the student may complete in lieu of the scheduled activity. The student must contact the course instructor beforehand or within two days of the activity to make arrangements for making up the missed activity. Accommodations for missed activities will be allowed for a maximum of 3 activities; if more than 3 scheduled activities are missed, the student will not be given credit for completing the course.

Students will work in groups and independently to complete activities and assignments for the experiential learning component of the class. To facilitate this, students are asked to be considerate and respectful of their lab mates in all discussions. The sharing of ideas during group work is encouraged, but it is expected and required that each student will do their own independent work in completing the assignments arising from experiential activities.

Participation

The format of this course is designed to facilitate involvement of students enrolled in a traditional, full-time study at the University of Saskatchewan campus in Saskatoon, as well as students who are only able to be on campus for limited periods of time. Experiential activities comprise the core purpose of in-class meetings. Much of the background information relevant to these activities is presented through written, online, and multi-media resources that students

can work through independently according to their own schedule. Regular assignments related to these background materials will be due according to the pre-arranged course schedule, and assessed to facilitate and inform student assessment of materials.

Experiential activities are organized throughout the term to include Thursday evening and Saturday day activities approximately every third week, or four times during the term (see the attached course schedule). Attendance at these class sessions is required in order to participate in the experiential activities. Activities will include a mixture of outdoor activities during field trips to locations in the vicinity of Saskatoon, indoor lab exercises, and discussion groups or story circles that involve local elders and/or researchers. Experiential activities are expected to result in a total of 42 student contact hours over the course of the term, with an estimated additional 18 hours of self-directed student experiential learning to record additional field observations.

Experiential Learning

Research and reflection assignments for the course will draw on experiential learning of students recorded during class activities and as part of independent work. Students will be encouraged to take notes in a small notebook while conducting field activities (“field notes”) and copies of these may be submitted as part of the assignments. Videos, photos, and sound recordings are also useful ways to document experiential learning that contributes to a particular assignment.

Recording of the Course

There are no provisions for recording this course, as many activities will take place outside. Students are welcome to make their own recordings, but must request permission if any video recordings are made of teaching assistants, guest instructors, or detailed activities of other students.

Copyright

Many of the videos recommended for this course are publicly accessible on the internet. Other copyrighted materials, such as the BBC “Frozen Planet” videos and the course textbook, will need to be purchased by students or accessed through the Library. The instructor not post any material to the Blackboard website that is not copyright-cleared. Students should take care to ensure that proper acknowledgement is given for any materials used in their assignments (such as music or artwork), and no copyright-restricted materials are used for the final educational assignment intended for posting on the Cradleboard website.

Student Feedback

Students are encouraged to provide written feedback on course materials and activities directly to the instructor by email or through campus mail. Constructive feedback on experiential activities and assignments will be solicited from students in the middle and end of the course, and used in refining the course design for future offerings.

Information on literal descriptors for grading at the University of Saskatchewan can be found at: <http://students.usask.ca/current/academics/grades/grading-system.php>

Please note: There are different literal descriptors for undergraduate and graduate students.

More information on the Academic Courses Policy on course delivery, examinations and assessment of student learning can be found at:

http://www.usask.ca/university_secretary/council/academiccourses.php

The University of Saskatchewan Learning Charter is intended to define aspirations about the learning experience that the University aims to provide, and the roles to be played in realizing these aspirations by students, instructors and the institution. A copy of the Learning Charter can be found at: http://www.usask.ca/university_secretary/LearningCharter.pdf

University of Saskatchewan Grading System (for undergraduate courses)

Exceptional (90-100) A superior performance with consistent evidence of

- a comprehensive, incisive grasp of the subject matter;
- an ability to make insightful critical evaluation of the material given;
- an exceptional capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

Excellent (80-90) An excellent performance with strong evidence of

- a comprehensive grasp of the subject matter;
- an ability to make sound critical evaluation of the material given;
- a very good capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

Good (70-79) A good performance with evidence of

- a substantial knowledge of the subject matter;
- a good understanding of the relevant issues and a good familiarity with the relevant literature and techniques;
- some capacity for original, creative and/or logical thinking;
- a good ability to organize, to analyze and to examine the subject material in a critical and constructive manner.

Satisfactory (60-69) A generally satisfactory and intellectually adequate performance with evidence of

- an acceptable basic grasp of the subject material;
- a fair understanding of the relevant issues;
- a general familiarity with the relevant literature and techniques;
- an ability to develop solutions to moderately difficult problems related to the subject material;
- a moderate ability to examine the material in a critical and analytical manner.

Minimal Pass (50-59) A barely acceptable performance with evidence of

- a familiarity with the subject material;
- some evidence that analytical skills have been developed;
- some understanding of relevant issues;
- some familiarity with the relevant literature and techniques;
- attempts to solve moderately difficult problems related to the subject material and to examine the material in a critical and analytical manner which are only partially successful.

Failure <50 An unacceptable performance

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 behavior 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 read and be familiar with the Regulations on Academic Student Misconduct (http://www.usask.ca/university_secretary/honesty/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/StudentNon-AcademicMisconduct2012.pdf)

For more information on what academic integrity means for students see the Student Conduct & Appeals section of the University Secretary Website at:
http://www.usask.ca/university_secretary/pdf/dishonesty_info_sheet.pdf

Examinations with Disability Services for Students (DSS)

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://www.students.usask.ca/disability/>, or contact DSS at 966-7273 or dss@usask.ca.

Students registered with DSS may request alternative arrangements for the final examination. Students must arrange such accommodations through DSS by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by DSS.

Acknowledgements

The Department of Biology acknowledges funding assistance for the development of this course from the University of Saskatchewan Curriculum Innovation Fund.