School of Science
RRMT 204
Guided Independent Studies in Renewable Resources Management: Winter Ecology
Term: Winter 2027
Number of Credits: 3

Course Outline

INSTRUCTOR: Ryan Agar, Tara Stehelin, and guest lecturers
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Telephone: (867) 456-6957
Classroom: TBA
Dates: Jan. 5 - Apr. 13, 2027, Classroom sessions occur on most Fridays from 1:00 – 4:00, field dates TBA.

COURSE DESCRIPTION

This is a three-credit course in which students, with the guidance of a research supervisor, instructor, prepare, implement, and report upon studies or research in the field of renewable resources management. Students use research methodology and the scientific process. Participants are expected to demonstrate organizational skills, the ability to work independently, think criticality, and present oral and written reports to professional standards. Topics may cover any field relevant to renewable resources management and those which include traditional knowledge or relevance to the implementation of land claim settlements are particularly encouraged.

This offering of RRMT 204 has been created for a winter ecology and winter survival course.

Learn the basics of winter ecology, safe and ethical planning, and travel for study in winter conditions in this 3-credit course that provides a blend of theoretical and practical outdoor learning. Students gain a broad and multiple-lensed range of knowledge about cold-adapted species and humans living and thriving in northern ecosystems, while gaining some outdoor experience. Students will learn of the evolutionary adaptations of northern wildlife, applying evolutionary, physiological, and behavioral perspectives. Students also learn the basic environmental measurements in winter ecology (such as the properties and layers of snow, and how conditions influence ecology and evolution of life histories) and the potential impacts of climate change on cold-adapted species. Students will also learn the basics of identifying and quantifying wildlife using winter cues. This course is aimed at students in the Renewable Resources Management diploma, but students in other programs are welcome to take it if there is room. This course requires a moderate level of physical fitness because students need to maneuver and walk in winter conditions.

COURSE REQUIREMENTS

Prerequisite(s): This course is open to students in the Renewable Resources Management (RRMT) program, Biological Sciences diploma, or other science program with permission of the coordinator/chair of the program. Required are one communications course (ENGL 100 or COMM 204 or COMM 100), RRMT 202 or other introductory statistics course, and one of CHEM 110, CHEM 111, ENVS 100, ENVS 101, GEOG 101, GEOG 102, BIOL 101, BIOL 102.

PHYSICAL FITNESS

In order to safely participate in this course students should have a reasonable level of personal fitness. At a minimum, students should be able to:

- travel on foot in winter conditions at a pace of 2 km per hour for up to four hours while carrying a 20-pound pack.

EQUIVALENCY OR TRANSFERABILITY

Please be aware that receiving institutions determine course transferability. Find further information at: https://www.yukonu.ca/admissions/transfer-credit

LEARNING OUTCOMES

Upon successful completion of the course, students at a basic level, will be able to

- apply evolutionary, physiological, and behavioral perspectives for cold-adapted wildlife, such as energetic trade-offs, heat production and strategy, torpor, and other adaptations,
- perform basic measurements and statistics of environmental and physical properties of winter ecosystems, such as the properties and layers of snow, and how conditions influence ecology and evolution of life histories,
- appreciate human and cultural adaptations, such as Indigenous principles of winter ecology and thriving within ecosystems of daily or seasonal cold,
- critically assess and analyze how climate change is altering winter ecology, including potential declines in fitness and extinction risk for cold-adapted species, and apply these concepts to real-world examples,
- identify and quantify northern wildlife using winter cues, such as tracks, droppings, and compare methods of tagging, individually identifying, or live-trapping for wildlife studies,
- safely and ethically plan and prepare for winter wilderness travel and survival with appropriate clothing, safety and communication plans, both for physical and psychological factors, group management, emergency kits, building of shelters, basic first aid responses for cold-weather injury, safe operation, loading and unloading of winter vehicles and equipment, the basics of safe travel on snow and river and lake ice, and
- plan and help manage group ethics, including the demonstration of care and respect for Knowledge Holders, the land and people visited, other students or participants.

COURSE FORMAT

This course will blend face-to-face lecture delivery with practical application of knowledge in a winter setting, in approximately a 1:1 ratio. For example, students will spend the first day of the course outside, and then on Friday afternoons from 1:00 – 3:00 (dates and times TBC), students will have theory

presentations and hands-on practice on campus with various Knowledge Holders, experienced outdoor field scientists or experts, and Elders or other spokespeople. Students will collect data for an independent winter ecology study during one or more of these field trips. Students will complete one of two possible full-day field instruction snowmobile safety and travel (delivered by a Yukon Government instructor, instructor TBA). The final assignment will involve the planning and actioning of a full-day hike and activities in winter conditions. More details to follow at the start of the course and on the Moodle site.

ASSESSMENTS

will include at minimum

a) a statement about preparedness to be outside for long periods of time in winter conditions and acceptance of risks involved, including a signed risk assessment form completed on Moodle,
b) a practical exam on northern wildlife identification using winter cues and environmental measurements such as snow measurements,
c) a semester-long project that will include a report summarizing raw data collected, a summary of basic statistical analyses – including descriptive statistics and at least one hypothesis-driven comparative statistical test, a discussion and conclusion.
d) a final product (polished final paper or oral presentation or poster) used to demonstrate successful completion and participation.

EVALUATION

Statement	**5%**
Practical exam	**30%**
Engaged participation in practical activities	**20%**
Semester-long final project, incl. summary statistics, statical test, discussion and conclusion	**20%**
Polished final project (edited paper, poster, or oral presentation)	**25%**
Total	**100%**

TEXTBOOKS & MATERIALS: None required, but students will be required to access and use scientific literature for final reports and correctly reference these works.

COURSE WITHDRAWAL INFORMATION

Refer to the YukonU website for important dates. https://www.yukonu.ca/admissions/important-dates

Outline and Schedule

EQUIPMENT

Students are required to have appropriate personal equipment and clothing to work and travel safely in winter conditions for three to four hours at temperatures that may be below -20 °C. Every student must have their own 30 – 40 L backpack for personal and group gear.

A gear list is provided as a guide. If uncertain, students should communicate with the instructor *before* the first class.

Gear Lists

Clothing

( ) Wool and/or Synthetic Socks
( ) Base Layer Top - Synthetic, wool or silk
( ) Base Layer Bottoms - Synthetic, wool or silk
( ) Mid-Insulation Layer Top - Pile (fleece), light synthetic fill or wool sweater/jacket
( ) Mid-Insulation Layer Bottom - Pile pants or multipurpose pants
( ) Light Wind Shell - Windproof, water resistant layer for high aerobic work
( ) Weather Layer Top - Gore-Tex or other waterproof breathable jacket
( ) Weather Layer Pants - Gore-Tex or other waterproof breathable pants
( ) Warm Outer Jacket - Down or synthetic
( ) Toque - Wool or Synthetic
( ) Face Warmer - Scarf, neck tube, face mask
( ) Light Gloves - Wool, synthetic or leather
( ) Insulated Gloves or Mitts - Wool or synthetic, w/ weather proof outershell
( ) Gaiters - if pants do not secure over boots

( ) Insulated hiking boots or winter boots

Personal Equipment

( ) Pack - Light, and comfortable, 30-40 litres
( ) Sunglasses
( ) Sun and Lip Cream
( ) Head Lamp
( ) Insulated Water Bottle or Thermos
( ) Lunch
( ) Blister Kit
( ) Individual First Aid Kit (IFAC)
( ) Pocket Knife
( ) Camera - *Optional*
( ) Binoculars - *Optional*

EQUIVALENCY OR TRANSFERABILITY

Successful completion of this course is required for graduation from the Renewable Resources Management diploma program.

Attendance & Participation

Attendance is mandatory at all lecture and field sessions. Every student is expected to actively participate in class activities; attendance alone does not result in full marks for the participation component.

Students will be assessed in the field on demonstrated ability to complete essential tasks such as:

- building a fire
- constructing improvised shelters
- layering and moisture management
- travelling safely in winter terrain
- identifying common Yukon wildlife based on tracks and/or scat

Snowmobile Operators Course

This course, if available, includes a snowmobile operators' course or (weather and instructor availability depending). This entails one introductory classroom session (to be scheduled) and one full-day practical session.

Students can bring personal snowmobiles if they wish, but they must be operational, registered, insured, and used with a helmet. Please notify the course instructor in advance if you are bringing a personal machine. On the full day practical session, students are expected to dress accordingly for the conditions and be able to spend a full day outside (i.e. no running shoes, only winter footwear!). Students will also need a lunch. Transportation to the field site is provided and encouraged. Students must operate snowmobiles in a safe and responsible manner, wear helmets, and follow directions of instructor(s). Failure to do so will prohibit participation. Snowmobile training is dependent on weather conditions, and marginal or hazardous weather could require this component be cancelled.

ACADEMIC INTEGRITY

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document.

Please refer to Academic Regulations & Procedures for further details about academic standing and student rights and responsibilities.

ACCESSIBILITY AND ACADEMIC ACCOMMODATION

Yukon University is committed to providing a positive, supportive, and barrier-free academic environment for all its students. Students experiencing barriers to full participation due to a visible or hidden disability (including hearing, vision, mobility, learning disability, mental health, chronic or temporary medical condition), should contact Accessibility Services for resources or to arrange academic accommodations: access@yukonu.ca.

TOPIC OUTLINE and SCHEDULE**Dates are tentative and subject to change depending on weather and other factors.*

Week or date	**Location**	**Instructor**	**Topics**
Jan. 22	Classroom	Stehelin	Introduction to Winter Ecology
Jan. 29	Classroom	Stehelin	Adaptations by wildlife, physiological, behavioral
Feb. 5	Classroom and outside	Stehelin	Human and cultural adaptations, impacts of climate change on cold-adapted species and cultures Collect snow data
Feb. 12	Classroom and outside	Agar	Planning for winter travel
Feb. 19	Classroom and outside	Agar	Planning for outdoor scenarios
Feb. 22 – 26th Reading Week			
Mar. 5 or 6th	Outside, all day	Agar	Winter trip
Mar. 12	Outside, all day	TBA	Snowmobile training
Mar. 19	Alternate day for outside trips if needed		
Mar. 26	Classroom	Stehelin	Final presentations and wrap up class