

Texts:

- Required: Marchand, P. J. 1996. Life in the cold. Third edition. University Press of New England. Additional readings will be posted as PDFs on Blackboard.
- Optional: Rezendes, P. 1999. Tracking and the art of seeing: how to read animal tracks and sign. Second edition. HarperCollins Publishers, New York.

Tentative schedule:

March 09: read Marchand chapters 1-2

- Course overview
- Climate and geography of polar, alpine, and local winter environments
- Characteristics of snow and ice

March 10: read Marchand chapters 4 (pages 94-125), 6, 7, 8

- Arctic, antarctic, alpine, and New England fauna: migrants, hibernators, cold-active residents
- Morphology, physiology, ecology, and behavior of cold-active animals

March 11

- Identification of mammal tracks and signs in snow
- Hibernation, torpor, and winter dormancy in mammals

March 12: read Marchand chapters 3, 4 (pages 125-141), 5

- Ectotherms (invertebrates, fishes, amphibians, and reptiles) in cold
- Plants in cold environments

March 13

- Field trip*

*Field trip date and destination depend entirely on recent weather conditions. We may make an all-day trip, or multiple shorter trips. Footwear suitable for walking in snow is required.

Requirements (% of grade):

- Take-home short-answer exam (30%) Based on readings and material presented in class. Exam will be posted on Blackboard after the last class meeting. *Due April 13.*
- Literature review and synthesis (30%). One 10-12 page paper summarizing the winter biology of a species or group of species of your choice, or some other aspect of life among snow and ice, based on recent primary research literature (journal articles). Evaluated on the basis of content, organization, and writing. *Due April 20.*

- Independent field observation report (10%). *Before the first class meeting*, complete your own field trip after snowfall (preferably after snow has been on the ground for two nights without additional snow). Record the following information: 1. Date, time, and place of observation. 2. General habitat (e.g., in a hilly forest dominated by mature oak, maple, and birch trees). 3. Conditions (recent and current temperature, snow cover, etc.). 4. Find at least one set of wild mammal tracks. 5. Follow the trail for as long as possible and document everything you can about the tracks, using photography, sketches, and measurements (print length and width, distance between prints, trail width, length of trail, trail route and distance, where the trail started and ended (if possible), etc.). Spend some time, look closely, and record precise, accurate, and plentiful observations. Use Rezendes (1999) or other tracking guides to identify the probable track maker. Try to discern behavior from the tracks and other sign. This report has no set format as long as it includes the information mentioned above. *Due March 9.*
- Commentary on primary research paper dealing with life in cold environments (10%). Make sure you have your Wesleyan user name and password; do this well before the first class. Connect to the Wesleyan University website, then click on Library. Under Find, Articles, click on "Indexes & Databases." Near the top of the page, click "Browse Resources." Under classification, click "Natural Science and Mathematics." Click "Biology." Scroll down and click on "BioOne." On the top line click on "Search." Scroll down and in the empty box to the right of "Anywhere in Article" or "Title" enter the name of a species or the word "winter," "snow," "ice," "cold," or any other term that might yield a paper that deals with the subject matter of this course. Scroll down a little and click on "Submit Search." Look through the results and click on Full Text or PDF for any paper that looks interesting. If you don't like the first one, choose another. If you don't find much, choose a different species or topic and try again. Read through the entire text of the paper you finally select. Provide the full citation for the article and write out brief answers to the following questions: What was the purpose of the study? Where was the study conducted and what methods were used? What was the primary result? What was your personal reaction/response to the study? Your write-up should be about 2-3 pages double-spaced at font size 12. *Due March 9.*
- Mammal winter track identification exam (10%). This will be posted on Blackboard as a take-home exam after the last class meeting. *Due April 6.*
- Class field trip report (10%). Due one week after the field trip. Report guidelines will be posted on Blackboard.