

Special Winter Session class
Winter Field Ecology (1 cr)
January 8-13, 2017
11:216:475

Registration opens Monday Oct 3, 2016

Instructor: Richard Lathrop
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School of Environmental & Biological Sciences

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Course Learning Objectives:

- To provide the student a field ecology experience in the "North Country" during the winter.
- To investigate the special problems of plants and animals during the cold winter months.
- Provide a better picture of how plants and animals interact with their physical environment and with each other during the winter season.

This 1 week course is held off-campus at the Adirondack Ecological Center in the Adirondack Mountains of upper New York State during the third week in January (January 8-13, 2017). During the field trip, activities will revolve around a series of field explorations in the winter environment investigating a variety of ecological questions/phenomena. This course requires a high level of physical exertion (i.e., hiking, snowshoeing) in sometimes extreme environmental conditions. Course requirements: include readings, field exercises, field journal, and oral presentation. Both undergraduate and graduate students are welcome. 2 credit option includes post-field trip completion of a independent research paper.

A pre-trip meeting scheduled for Wednesday December 10 at 6pm in Room 145 ENRS.

Sign up through Rutgers Winter sessions <http://wintersession.rutgers.edu/>

If you are interested in a 2 credit option, then you would sign up for the 1 credit Winter session course and 1 credit independent study (with me through the 704 curriculum) for the spring semester = (1 credit winter session, 1 credit spring semester).

Course costs: tuition (1 credit), regular fees and special course fee. The special course fee covers all food, lodging and transportation from Rutgers to the Adirondacks.

To see a slide show of winter 2009
<http://www-rci.rutgers.edu/~deenr/Winter-Ecology-2009.html>

For more Information, contact the instructor Prof. Rick Lathrop
lathrop@crssa.rutgers.edu

Special Winter Session course: Winter Field Ecology

1. Course Objectives:

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2. Texts: Life in the Cold, Peter Marchand, 3rd ed, 1996

Winter: An Ecological Handbook (Halfpenny & Ozanne, 1989);

Optional: Stokes Guide to Nature in Winter (Stokes, 1979)

- ### 3. Course requirements/expectations: Each student will prepare (**prior to the field trip**) and lead a 15 minute discussion on two of the course topics (listed below; each student will be assigned two topics). Use whatever audiovisual props you can devise. Be creative.

Winter Environment:

- 1- what makes winter winter? What's the SCREW factor?
- 2- energy transfer: How do objects gain and lose energy?
- 3- the essence of snow: How does snow form and change with time?
- 4- snowpack physics: How does snowpack change? Is snow a good insulator?
- 5- Snow and radiant energy: Why is snow white?

Under the Ice:

- 6- water/ice physics: Why does cold water sink? Why does ice float?
- 7- life under the ice: What are the pros/cons of dormancy vs. activity?

Plants:

- 8- the freezing problem: How do plants tolerate sub-freezing temperatures?
- 9- the dessication problem: Is winter drought a problem for plants?
- 10- evergreen vs. deciduousness: Are there advantages to being an evergreen?

Animals:

- 11- temperature effects on biochemistry: Do I really want my fat unsaturated?
- 12- thermoregulation: physical vs. physiological responses of warm-blooded critters
- 13- adaptive significance of body shape/size/color: Is being big & white really better?
- 14- the cold-blooded gamble: Is it better to freeze or not?

Plant/Animal Interactions:

- 15- winter browsing: What defenses do plants have to reduce foraging pressure?

Humans

- 16- Human physiological adaptations to cold

The students will be required to keep a **daily journal** that records readings/class/field notes, personal observations/reflections, sketches/photos and a listing of all plant/animal species observed including common and Latin names. **The journal is your opportunity to record and synthesize what you have observed and learned.** This should be organized within a hardbound journal and worked on during the 1 week field course. There will be free time periodically through the day and in the evenings for you to work on your journal. The journal will be handed in one week after the end of the course, evaluated and returned to you to keep as a record of the experience.

11:704:475 Winter Field Ecology Schedule for week of January 8-13, 2017

Sunday, January 8

AM **Meet at ENR parking lot at 8:00AM.** Drive to AEC.
Lunch (on the road – bring cash)

PM Visitor Interpretative Center (VIC) Orientation Hike/Snowshoe

Evening History of AEC and Huntington Wild Forest: Paul Hai (VIC) (7:30pm)

Monday, January 9

AM Presentations on Winter Environment:
1- what is winter? What's the SCREW factor?
2- energy transfer: How do objects gain and lose energy?
3- essence of snow: how does it form? Why so many types?
4- snowpack physics: How does snowpack change with time?
5- snow and radiant energy: why is snow white?

Field Exercise: Snowpack environment- thermal profile observations

Lunch (at VIC)

PM Recon small mammal trapping protocol/grids

Tour VIC exhibits: Adirondacks Landscape & History
Lodo Pond Snowshoe: Vegetation Communities & Winter Plant ID

Construct Snow Shelter (if sufficient snow) – starting piling snow

Evening Presentation on Small Mammals of the Adirondacks: C. Demers (VIC)
Set out traps (on snowshoe)

Tuesday, January 10

AM Check traps, process and return catch (8:30am)

Presentation on:
6- Water/ice physics: Why does cold water sink? Why does ice float?
7- life under the ice: What are the pros/cons of dormancy vs. activity?

Field Exercise: Water/Ice environment (on Rich Lake)
- Thermal profile observations
- Trends in Ice-in & Ice-Out

Lunch (at VIC)

PM Presentations on Animals in Winter:
11- temperature effects on biochemistry: Do I really want my fat unsaturated?
12- thermoregulation: physical vs. physiological responses of warm-blooded

critters

13- adaptive significance of body shape/size/color: Is being big & white really better?

14- the cold-blooded gamble: Is it better to freeze or not?

16- Human responses to the cold

Field Exercise: Principles of Heat & Energy Transfer - hot potatoes

VIC Trails: Winter Habitat Utilization and Tracking

Construct Snow Shelter (if sufficient snow) – start digging out

Evening Night Hike/Star Find (meet at Director's House)

Wednesday, January 11

AM Winter Travel Exercise: Foot-loading

Presentations on Plants and Plant/Animal Interactions in Winter:

8- the freezing problem: How do plants tolerate subfreezing temperatures?

9- the dessication problem: Is winter drought a problem for plants?

10- evergreen vs. deciduousness: Are there advantages to being evergreen?

15- winter browsing: What defenses do plants have to reduce foraging?

Lunch (at VIC)

PM Tour Arbutus Lodge and Snowshoe Arbutus Lake Old growth forest

Evening Game Night (meet at Director's House)

Thursday, January 12

AM Hike to Goodnow Mountain. Adirondack Landscape Interpretation.

Lunch (in field)

PM Free time. Work on journals.

Evening Campfire (meet at Director's House)

Friday, January 13

AM Pack, Clean, Load up.

Lunch (on road, bring cash). Return to ENRS by 3-4pm.

Winter Ecology Field Trip January 8-13, 2017

We will be staying at the Adirondack Ecological Center (AEC) in Newcomb, New York. For AEC's web site go to: <http://www.esf.edu/aec/>. In an Emergency, the caretaker's phone number at AEC is (518) 582-4551. My cell phone (Rick Lathrop) is (908) 229-1779 (cell phone coverage is spotty at best up in the Adirondacks). My office phone number is (848) 932-1580. My e-mail: lathrop@crssa.rutgers.edu. Contact me at home or office (or both) if for whatever reason you can't attend the course.

Suggested Equipment List:

- Duffel bag to carry all this gear in
- Small backpack or large daypack for daytrips
- 3 season sleeping bag (bedding not provided) – 4 (0°) season if you want to camp
- Closed-cell pad – long pad to sleep outside, short pad for sitting/lounging
- Winter (insulated) boots – **very important**
- Winter parka (insulated)
- Snow/ski pants or shell
- Lighter weight jacket and/or vest
- Rain gear - top and bottom – or poncho
- Heavy pants (2 pr) - wool, pile or fiberfill insulated (recommended)
- Long underwear (2 pr) - top and bottom (polypro recommended)
- Extra top layers - Turtleneck, wool/pile sweaters
- Underwear - your choice
- Hat - preferably two, so one fits inside the other
- Earmuffs
- Neck gaiter or face mask or scarf
- Insulated mittens/gloves with windproof shell
- Lighter weight gloves
- Sunglasses
- Insulated/removable inner soles
- Gaiters (keep snow out of your boots)
- Insulated booties/slippers with sole - for in cabin use
- Thick outer socks - several pairs (1 for each day)
- Thinner inner socks - several pairs
- Several packs of handwarmers/footwarmers
- Flashlight or headlamp
- Survival/First Aid Kit: Compass, matches/pen knife/whistle
- Insulated mug
- 2 refillable water bottles
- Various and sundry toiletries, including towel
- Calculator
- Clipboard
- Journal (hardbound) – colored pencils, clear packing tape (optional)
- _Optional
- X-country skis, poles, boots
- Binoculars
- Camera

PERSONAL SAFETY

To be a safe winter traveler, one must carry adequate clothes and equipment, know how to prevent accidents, and be capable of dealing with any possible emergency. Many books are available on these subjects - check them out from the RU library, RU Outdoor Club collection or your local library. The following will mention some specific concerns for those hiking/skiing/snowshoeing.

Hypothermia

The most common mistake of winter hikers is to underestimate the severity of weather conditions, and to run the risk of hypothermia - the rapid chilling of the core body temperature due to wind and wetness. You want to stay dry as possible, both from rain/snow and sweat. Dress in layers, strip while hiking, add the layers back while resting. Rain is always a possibility so a waterproof outer shell, both top and bottom, is critical. Windchill is also a concern, especially on the summit, your waterproof shell can double as a wind shell to protect against the biting winter winds. In severe weather, everyone should stop and put on appropriate clothes, including rain/windproof jackets and pants and hats and mittens. Special caution should be displayed in crossing streams. They may appear sufficiently ice-covered and safe but beware (read Jack London's "To Build a Fire" if you question this advice).

Frostbite

Frostbite is an ever present concern in winter. Exposed areas (ears, nose, cheeks) and limbs (fingers, toes) are especially susceptible. Wear layered socks and mittens, but not too tight that circulation is restricted. Mittens are better than gloves. A pair of glove-liners is useful for handling skis, snowshoes in cold weather. You shouldn't touch metal with bare skin - it sticks. Remove water-soaked socks/mittens - always bring an extra pair. Avoid cotton, use wool or other wicking materials instead. Watch exposed areas, use a buddy system to look for grey, waxy skin. Warm with bare hand and breath but don't rub. For severe frostbit toes/fingers, warm slowly with warm water back at the cabin - DO NOT let refreeze at all costs. Thus only treat when back at a safe, warm location.

Winter Travel

Never go out hiking any distance (> 1/4 mile) from camp alone. Travel in pairs and preferably in threes (1 person to stay with the injured, 1 person to go get help). Leave a trip itinerary in the Winter Headquarters (persons on trip, trip objective, trails to be taken, mode of transport, time of departure, expected time of arrival). Always keep a large margin of caution - stay in control. Each person should carry a map and compass, matches, water, extra clothing.

Winter Ecology Field Trip January 8-13, 2017

I have read the above information on suggested equipment and personal safety. I understand that there are risks to life and limb associated with this trip and outdoor winter travel. I agree to behave in a safe and responsible fashion as there is the possibility of seriously injuring either myself or others.

In general, Rutgers University expects its members to demonstrate respect and regard for the rights, property and persons of all individuals; to take responsibility for their own actions; and to act to reduce risk of damage and harm.

Signature

Date

Student ID#

In Case of Emergency, contact the following person:

Name

Address

Phone #



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