Special Winter Session course: Winter Field Ecology
Course # 11:704:475 Index#

Sign up through Rutgers Winter sessions  https://wintersession.rutgers.edu

This 1 week course is held off-campus at the Adirondack Ecological Center (AEC) in the Adirondack Mountains of upstate New York during the third week in January (January 11-16, 2009). 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 (its cold up there but that's the fun of it!). Course requirements: include readings, field exercises, field journal, and oral presentation.

The Winter Session course is 1 credit. A 2 credit option is available which includes post-field trip completion of an independent research paper. 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 include 1 credit of tuition plus additional fees of approximately $275 to food, lodging, transportation and AEC programming. We will be staying in heated cabins with showers. We will be building a snow shelter, so there is an opportunity to camp out if you so desire. You will need warm winter clothing and boots. Snowshoes will be provided. A list of suggested equipment will be provided at a pre-trip meeting to be held in December, 2009 (date to be announced).

For more information on the Adirondack Ecological Center (AEC), go to http://www.esf.edu/aec/

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

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

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

   **Winter Environment:**
   - what makes winter winter? What’s the SCREW factor?
   - energy transfer: How do objects gain and lose energy?
   - the essence of snow: How does snow form and change with time?
   - snowpack physics: How does snowpack change? Is snow a good insulator?
   - Snow and radiant energy: Why is snow white?

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

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

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

   **Plant/Animal Interactions:**
   - winter browsing: What defenses do plants have to reduce foraging pressure?

   **Humans**
   - Human physiological adaptations to cold

   During the field trip, activities will revolve around group hikes/field trips and group projects. The projects will entail the students investigating an ecological question/phenomena that is backed up by independent field observation or measurement, a short write-up and presentation. **Bring a calculator. The students will be required to keep a journal that records class/field notes, personal observations/reflections and sketches/photos. The journal will be handed in one week after the end of the course and evaluated.**

4. Grading: Credit/No Credit basis or Letter grade.
Sunday, January 10
AM  Meet at ENR parking lot at 8:15AM. Drive to AEC.
     Lunch (on the road – bring cash)
PM   Facilities Orientation Walk.
Evening History of AEC and Huntington Wild Forest – Paul Hai (AEC) (7:30pm)
     Winter Star Find (weather permitting)

Monday, January 11
AM   Presentations on Winter Environment:
     - what is winter? What’s the SCREW factor?
     - energy transfer: How do objects gain and lose energy?
     - essence of snow: how does it form? Why so many types?
     - snowpack physics: How does snowpack change with time?
     - snow and radiant energy: why is snow white?

     Field Exercise: Snowpack environment- thermal profile observations
     Construct Snow Shelter (if sufficient snow)

     Lunch (in camp)

PM   Recon small mammal trapping grids
     Adirondacks Landscape
     - Geology and landforms
     - Vegetation Communities & Winter Plant ID.
     Visit Adirondack Visitor Center and Hike/Snowshoe the trails

Evening Presentation on Small Mammals of the Adirondacks, Eric Vinson (AEC)
     Set out traps

Tuesday, January 12
AM   Check traps, process and return catch (8:30am)
     Presentation on:
     - Water/ice physics: Why does cold water sink? Why does ice float?

     Field Exercise: Water/Ice environment
     - Thermal profile observations
     - Trends in Ice-in & Ice-Out

     Lunch (in camp)
PM   Presentations on Animals in Winter:
- temperature effects on biochemistry: Do I really want my fat unsaturated?
- thermoregulation: physical vs. physiological responses of warm-blooded critters
- adaptive significance of body shape/size/color: Is being big and white really better?
- the cold-blooded gamble: Is it better to freeze or not?
- life under the ice: What are the pros/cons of dormancy vs. activity?

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

Lodo Pond Hike - Flow nature trail

Evening
Presentations on Humans in Winter
- Human responses to the cold
Night Hike

Wednesday, January 13
AM   Presentations on Plants and Plant/Animal Interactions in Winter:
- the freezing problem: How do plants tolerate subfreezing temperatures?
- the dessication problem: Is winter drought a problem for plants?
- evergreen vs. deciduousness: Are there advantages to being an evergreen?
- winter browsing: What defenses do plants have to reduce foraging?

Lunch (in field)

PM   Winter Habitat Utilization and Tracking: Hike in Huntington Wild Forest
Field Exercise: Winter Browsing

Thursday, January 14
AM   Hike to Goodnow Mountain. Adirondack Landscape Interpretation.

Lunch (in field)

PM   Winter Travel Exercise: Foot-loading

Free time. Work on journals.
Discussion topic for journal: What good is winter? If global warming wipes out winter as we know it, will it matter?

Evening   Campfire

Friday, January 15
AM   Pack, Clean, Load up.
Lunch (on road, bring cash).   Return to ENRS by 5pm.
Winter Ecology Field Trip  January 10-15, 2010

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 (732) 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 (0º) 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 / regular pants (jeans)
___ 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
___ Compass
___ Survival/First Aid Kit: matches/pen knife/whistle
___ 2 refillable water bottles
___ Various and sundry toiletries, including towel
___ Calculator
___ Clipboard
Optional
___ X-country skis, poles, boots
___ Binoculars
___ Camera
___ Entertainment: Games, musical instrument
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 Director’s Residence (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 10-15, 2010

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 #