

University of Ottawa

Course Title:	Alpine Ecology https://alpecol.wordpress.com/
Instructor(s):	Dr. Jessica Forrest Department of Biology University of Ottawa Ottawa, Ontario, K1N 6N5 Tel.: 613-562-5800 x 3948 jforrest@uottawa.ca http://forrestlab.wordpress.com
Dates:	Saturday August 12 to Saturday August 26, 2023 (12 days of instruction, one day of rest, and two days of travel)
Location:	Rocky Mountain Biological Laboratory (RMBL), near Crested Butte, Colorado, USA: http://www.rmbll.org/
Cost:	~\$2500 (including \$350 deposit). This covers housing, meals, and user fees for 14 days at RMBL, as well as course supplies and travel around RMBL. It does not include travel to Colorado from Ontario (estimated at ~\$750 return). Exact cost will depend on enrollment and the exchange rate at time of payment of the balance (August 1, 2023). Excellent Health and Travel Insurance are strongly advised. Please continue to check the OUPFB website for updates about Covid_19 and other policies, as well as checking in regularly with the course director in the months before the course begins.
Prerequisites:	First-year biology and an introductory statistics course. Additional courses in ecology or evolution are strongly recommended. Students must be physically fit and prepared for spectacular but sometimes uncomfortable conditions (outhouses, near-freezing temperatures during the night and early morning, no phone service, limited internet). Note that we will be hiking steep slopes at elevations > 3000 m, where oxygen levels are ~70% of those at sea level; even very healthy people find themselves short of breath at this altitude, and people with respiratory conditions may find it impossible. Students must have a passport valid until at least the end of August, no known barriers to entry to the United States, and proof of travel medical insurance covering a 14-day stay in the U.S. Non-Canadian students will need to determine visa requirements. Students will be required to sign a liability waiver to stay at RMBL (available at http://www.rmbll.org/staff-info), in addition to the course waiver.
Enrolment*:	12 (3)
Course Description (brief):	Students will spend two weeks in the awe-inspiring landscape of the Elk Mountains, learning about the unique challenges of life at high altitudes, how various plant and animal species have adapted to these challenges, and the threats posed to alpine habitats by current anthropogenic changes. Instruction will involve a mixture of guided walks, lectures, readings, and field data collection. During the first week of the course, we will explore different alpine and subalpine habitats, learning about their natural history and how to sample organisms and environmental variables along elevational gradients. We will give equal attention to plants and animals, including both vertebrates and invertebrates. Students will learn about some of the classic long-term studies taking place at RMBL, such as those on flowering phenology, climate change, marmot behaviour, and stream ecology. In the second week, students will conduct independent research projects, with guidance from the instructor, to test an ecological or evolutionary hypothesis of their choice. Students will gain experience with all aspects of experimental design, data analysis, and presentation of scientific findings.
Evaluation:	Field identification quiz (10%); participation in class discussions, seminars, and field exercises (15%); project proposal and presentation (20%); field notebook or datasheets with raw data (5%); final data spreadsheet (5%); final group presentation (15%); and final individual paper due September 23 (30%).

An Average Day – What to Expect

<p>(a) Daily timeline</p>	<p>During the first week of the course, activities will be a mixture of lectures (1-2 hours), class discussions, and outings to learn about the local biota or about particular researchers' study systems. In addition, we will spend two full days (likely days 3 and 5) on long hikes, sampling insects or plants along an elevational gradient. Throughout the course, we will eat meals at the RMBL dining hall (except for some packed lunches), so mealtimes are inflexible (breakfast 7:00-7:30, lunch 12:00-12:30, dinner 18:00-18:30). Course activities will typically run from 8:00 or 8:30 to 16:30 or 17:00, with short breaks as needed throughout the day. There will also be occasional, optional evening activities (e.g., in the past these have included scientific lectures for the whole RMBL community, a cricket match, and square dancing)—but you will likely also need to spend some evening time working on course assignments, since the time allotted to working on assignments during the day is not likely to be sufficient. Students typically find the first week quite tiring, since there is a lot to learn and a proposal to write, all while acclimating to the altitude.</p> <p>At the end of the first week, there will be a 1.5-day "weekend", during which students can hike a mountain (with the instructor), travel to the nearby town of Crested Butte, do laundry, prepare for their independent projects, and/or rest.</p> <p>During the second week of the course, students will work in small groups (2-4 students per group) on independent research projects, so there will be more flexibility with schedules—that is, you can adjust your lunch- and break-times to fit your sampling schedule. However, you will still eat (at least) breakfasts and dinners together in the dining hall.</p> <p>On the last day before departure, students will present their project results and submit their final datasets. They will also need to clean their cabins, pack, and complete the course evaluation.</p>
<p>(b) Work habitat & Physical exertion</p>	<p>We will be hiking on steep, rocky, mountain trails—and sometimes off trail. There is a mandatory mountain hike in week 1, which most students find extremely physically challenging. We will ascend to an elevation of 3800 m at an average grade of approx. 13% (steep!—especially when your body is still adjusting to the thin air). The ascent takes approximately 3 hours, and you will be carrying a lunch, snacks, extra clothes, and at least 2L of water. Every year, one student—always someone who tells me afterward that she's never actually liked hiking—ends up in tears on this hike because of sheer physical exhaustion. If you don't like hiking, do not sign up for this course. If you do sign up for this course, be sure you have good hiking boots with solid ankle support.</p> <p>Other than the one required mountain hike, the other hikes are either optional or shorter and easier. But you should expect to be walking, frequently uphill, for <i>at least</i> 2 hours every day.</p>
<p>(c) Common activities</p>	<p>Other than hiking, the common activities will depend on the project you choose to work on.</p> <p>Regardless, you will be outdoors during much of the day for two weeks at high elevation, so possible risks and hazards include sunburn (UV intensity is greater at high altitude), lightning, blisters, twisted ankles, fatigue, dehydration, wild animals, and altitude sickness. Risks are enumerated (along with mitigation measures) in the course waiver, which students will need to sign before arriving in Colorado. We will also cover basic safety measures on the first day of the course.</p>
<p>(d) Weather, dehydration, & biting insects</p>	<ul style="list-style-type: none"> • Weather is extremely variable in the mountains. Mornings are cold (typically around 0°C), but air temperatures can reach 20°C during the day—and it can feel much hotter in the sun (at high elevation, solar radiation makes a bigger difference than air temperature to how warm you feel). • Mountain summits and ridgetops can be windy and cold, so it's important to bring extra clothes (windbreaker, warm hat, gloves) on mountain hikes. • Air is generally dry at high elevation, so dry skin, chapped lips, and even light nosebleeds are common. You will need to drink a lot of water. • August is monsoon season in the mountains, so afternoon thunderstorms are common. In late August, it's not unusual to have a few completely rainy (or snowy), miserable days. • There are typically few biting insects at RMBL in August, but there are always non-biting insects around (flies, bees, grasshoppers, etc.).

(e) Toxic/poisonous, wildlife/ plants	<ul style="list-style-type: none"> • Mice are common, including in some of the cabins, and they can carry hantavirus, a potentially fatal respiratory illness. There have been no cases of hantavirus so far in the area around RMBL, but the disease does occur elsewhere in Colorado. • Ticks are rare at this elevation but they can occur and vector diseases. • Black bears are common, and they are especially likely to be encountered in late summer when searching for food before hibernation. Keep cabin and outhouse doors latched, and dispose of garbage in bear-proof dumpsters. • Mountain lions (cougars) are present in the area but rarely encountered. • Moose have become increasingly common and can be dangerous if threatened. • To minimize the risk of attack by large mammals, avoid hiking alone beyond the townsite. Do not approach large mammals. Make yourself conspicuous when hiking so that animals know you are approaching and can stay away.
(f) Sleeping, washroom & laundry facilities	<ul style="list-style-type: none"> • The research station is located in the abandoned mining town (townsite) of Gothic, Colorado. More information is available on the course website (https://alpecol.wordpress.com/field-station/) and in the 2022 RMBL Handbook. • Sleeping accommodations are rustic cabins. Some are old (e.g. 1950s), and most lack insulation. Images and detailed information available here: https://www.rmb.org/field-station-info/housing/ - but note that you will be assigned a shared cabin (you will not have your own choice of a cabin). • Bedding is not provided. You will need to bring your own sleeping bag, rated to -5°C or below, and a pillow (if you want to have one). • Toilets in the townsite (where we will be based) are outhouses. On field outings, you will have to pee outdoors. • There is a communal wash-house in the townsite. One side has showers; the other side has laundry facilities (washer and dryer – though the air is so dry that you’re usually better to just hang your clothes outside to dry).
(g) Meal plans & food allergies	<ul style="list-style-type: none"> • We will be on the RMBL meal plan throughout the course (buffet-style breakfast, lunch, and dinner). On days when we’ll be in the field all day, we can request that the dining hall provide supplies for us to pack lunches. You may want to bring or purchase additional snacks. • You will be asked before the course whether you want the vegetarian or meat meal plan. At the moment, there isn’t a vegan meal plan, so if you are vegan, you may want to bring supplementary food of your own. However, the dining hall staff tend to be very accommodating, and they often provide vegan food (especially if you let them know your needs). There is also a well-stocked salad bar and (at least in past years) a “left-overs fridge”. There have been vegan students on the course before and they found enough to eat. • You will be asked before the course about any food allergies. The dining hall will normally accommodate these.
(h) Non-academic responsibilities	<p>You are expected to help keep the cabins, classroom, and computer lab clean; you must also return any equipment you borrow from the field station. Cabins will be inspected before your departure by RMBL staff and you will be required to pay a cleaning fee if your cabin isn’t clean. Participation marks may be deducted if students do not keep common space clean.</p> <p>Students are asked not to use their phones during lectures, student presentations, and mealtimes. Participation marks may be used to enforce this policy.</p>
(i) Degree of isolation	<ul style="list-style-type: none"> • Cabins and classrooms all have electricity, but power outages are not uncommon. • There is no phone service in the townsite. • There is a computer lab with approx. 10 computers and two printers in the centre of the townsite. These are usually available for use. • There is wireless internet in the townsite, but coverage can be poor in some areas, bandwidth is limited, and outages are not uncommon. You must not use internet to stream video or otherwise consume excessive bandwidth. • You can purchase a few things (e.g., snacks, coffee, postcards) at the Gothic Visitor Center and the Gothic Science Café, but there is no real store in the townsite. There will be no easy way to get personal hygiene supplies or other missing items during the first week of the course. There will be an opportunity to re-stock after the first week, but you should not expect to be able to shop during the week. • In the event of medical difficulties, there is a clinic in the town of Mt. Crested Butte, approx. 6 km from the townsite.
(j) Alcohol & drugs	<p>Alcohol and cannabis use is permitted for students of legal age (21 in Colorado) outside of class hours, provided it does not interfere with class activities or lead to inappropriate or unsafe behaviour. Students must exercise caution, since effects of drugs can be intensified at high elevation. Moderation is strongly advised.</p>

(k) Vaccinations/ Insurances	No particular vaccinations are required. Students must have travel medical insurance for the U.S.
(l) Social Situations	<p>You will likely be sharing a cabin with at least two other students, and potentially as many as seven. You are likely to be sharing a room with 1-2 other students. These students may also be field-course students, or they may be working as researchers or research assistants at RMBL. In the latter case, they may be keeping different hours than we are.</p> <p>During the first week of the course, you will be spending most of your time during the day with the entire class. If you need your own space outside of class time, you should be able to find something (e.g., there is a small library, the community centre, the natural history building, etc.).</p> <p>During the second week of the course, you will spend most of your time with your project group. Sometimes group members start to dislike one another. Instructors will do what we can to help in these situations, but we also expect everyone to behave as responsible and respectful adults – which means working together even if you dislike each other.</p>
(m) Final comments	<p>If you dislike physical activity or the outdoors, this is not the course for you.</p> <p>If you love hiking and want to learn about alpine plants and wildlife at a world-renowned biological research station, and you don't mind sharing moderately uncomfortable living quarters with other people for two weeks, this course could be a good fit.</p>