



Summer Session 2020

BIOE 416 Alpine Ecology Syllabus

3 credits; Lectures, Labs, Field Work

Course dates: July 20 – 31, 2020

Instructor: Dr. Wendy Ridenour

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Prerequisites: One semester of college-level biology, chemistry, ecology and mathematics.

Course Description:

Exploration of the distribution, abundance and biotic interactions of plants and animals and their unique ecophysiological adaptations to life in the rigorous environments of high mountains above the timberline, with emphasis on the Crown of the Continent area. Students learn about the distribution of plants and animals and study the processes and interactions that are the foundation to ecology in alpine environments. Emphasis is placed on the processes that organize communities including drivers of global climate, and the complex interrelationships of biotic and abiotic interactions, including natural and human components as modifiers of system dynamics, and how those processes affect alpine systems. The class is organized around field trips and data intensive class projects that underscore major concepts and allow training in data collection, analysis, writing a scientific paper, presentation and interpretation by students.

Student Learning Objectives:

1. Understand the fundamental concepts and theories in community ecology and the integrative, multidisciplinary approaches used to study ecological communities (ELO 4).
2. Be able to read, evaluate, interpret, and discuss primary literature and reflect on its scientific impact (ELO 4).
3. Demonstrate the ability to conduct research in community ecology, keep a field/lab notebook, and write a scientific report (ELO 2, 4 & 10).

AACU-LEAP Essential Learning Outcomes (ELO's)

Beginning in school, and continuing at successively higher levels across their college studies, students should prepare for twenty-first-century challenges by gaining intellectual and practical skills, practiced extensively, across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance including:

ELO-2: Inquiry and analysis (IA)

ELO-4: Critical thinking (CIT)

ELO-10: Problem solving (PS)

Required Text: Lesica, Peter. 2012. Manual of Montana Vascular Plants, Botanical Research Inst of Texas. ISBN-10: 1889878391, ISBN-13: 978-1889878393 (available for purchase at the FLBS Bookstore).

Reference Texts: Electronic copies of supplementary material will be provided by the professor. Other reference books and field guides will be available in the classroom.

VERY IMPORTANT NOTE—To enjoy this course and to learn the content fully, you must be in reasonably good physical condition, able to hike up to 10+ miles a day in strenuous conditions at altitude and properly equipped for a great deal of hiking.

Course and Field Supplies/Equipment: (*available for purchase at the FLBS Bookstore)

Students should bring the following supplies:

- Rite in the Rain field notebook*
- Permanent ink pens and a few pencils*
- Hot/cold mug*
- Packable water bottles (total capacity at least 2 liters)
- Lunch pack-up container (resealable)*
- Mess kit
- Bear spray*
- Wading shoes or sandals - Binoculars
- Flashlight (headlamp) and batteries
- Camera (optional, but great scenery in this class)
- Laptop computer with MS Excel & MS Word
- Personal First Aid Kit
- Raincoat

REQUIRED Overnight Field Gear and Other Items to Bring Checklists: <http://flbs.umt.edu/urls/lists>

Evaluation and Grading:

A written exam, a scientific paper produced from research projects conducted in Glacier National Park, a corresponding power point presentation, plus active participation in all activities are the basis of your grade and evaluation. You will be required to complete a first draft of the paper in a timely manner, turn the first draft in to me, and I will return an edited version to you soon afterwards. Your paper grade will be based on the final draft you produce from my edits. This provides an excellent opportunity to learn how to write scientific papers.

Graduate Credit Increment

Graduate student evaluation and grading increment involves completion of a more sophisticated final research paper, based upon original data collected in the field in GNP, that is worthy of publication in a peer reviewed scientific journal.

Course Policies:

Students will adhere to University of Montana Student Conduct Code and Discrimination, Harassment, Sexual Misconduct, Stalking, and Retaliation Policy (UM policy website: <http://www.umt.edu/safety/policies/>). Students must also adhere to the FLBS Code of Conduct and FLBS Rules and Regulations, as well as abide by the Safety Orientation Checklist.

FLBS students are required to complete University of Montana Prevention Education Program courses: AlcoholEdu and Sexual Assault Prevention for Adult Learners after coursework begins and prior to completion of coursework.

Schedule:

The schedule below will be updated in late Spring 2020; the schedule is also subject to change while class is in session based on conditions at field sites.

Note: Make sure you pack your brown bag lunch each day at breakfast!

Day / Week	Lectures/Labs/Field Work
20-Jul-2020 (M)	Introduction, alpine climate, morphological and physiological adaptations to the alpine climate, community ecology of alpine environment, plant ID lab
21-Jul-2020 (T)	Biomes and alpine community ecology, Glacier National Park (GNP) via Logan Pass, overnight at Many Glacier group campground
22-Jul-2020 (W)	Glacial succession, GNP Grinnell Glacier, overnight at Many Glacier group campground
23-Jul-2020 (Th)	Depart Many Glacier group campground am; arrive back at FLBS late morning; afternoon written exam
24-Jul-2020 (F)	Writing: scientific paper proposal and draft introduction due
27-Jul-2020 (M)	Data collection and community interactions day 1 at GNP Scenic Point (hike roundtrip 7.8 mi, elev. gain 716 m https://tinyurl.com/y25ph9te), overnight at Two Medicine group campground
28-Jul-2020 (T)	Data collection and community interactions day 2 at GNP Scenic Point, overnight at Two Medicine group campground
29-Jul-2020 (W)	Alpine tundra animal behavioral observations, GNP Triple Divide Pass
30-Jul-2020 (Th)	Depart Two Medicine group campground am and arrive back at FLBS late morning, work on scientific paper
31-Jul-2020 (F)	Final presentations and final draft of paper due

Students with disabilities may request reasonable modifications by contacting the instructor. The University of Montana assures equal access to instruction for students with disabilities in collaboration with instructors and Disability Services for Students (406.243.2243, <http://www.umt.edu/dss/default.php>.) The University does not permit fundamental alterations of academic standards or retroactive modifications.