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### FORS 335.01: Forest Ecology Field Laboratory

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# Syllabus - FORS 335 Forest Ecology Field Laboratory

1 credit; laboratory and field trips

Course meetings: Monday, 1:00 – 6:00 PM plus two weekend field trips

## Instructor

Andrew J. Larson

E-mail: a.larson@umontana.edu

Office: CHCB 405A

## Prerequisites and Co-requisites

Prerequisites: BSF major **or** consent of instructor; AND FORS 130 Introductory Field Skills **or** FORS 202 Mensuration

Co-requisites: FORS 330 Forest Ecology

## Course Description

Ecology is the scientific study of relationships between organisms and the physical environment, organisms and other organisms, and the cycling of matter and energy. Forest ecology is concerned with the structure, composition, function, and dynamics of forests as three-dimensional ecological systems, and is the primary scientific basis of forest management. This course introduces field techniques for measuring forest ecosystem attributes, introduces computer based data analysis, and illustrates foundational forest ecology theory and concepts with field visits to forest ecosystems.

This course is field-based and requires the ability to safely walk and work off trails and roads on steep, forested terrain. Students must be able to walk up to 10 miles in a day on trails with up to 3000' of elevation gain to participate in this course. Field labs occur in all weather conditions. Come prepared to all field labs with appropriate shoes—boots, or secure wading shoes or sandals (not flip-flops) for the forest-river interaction lab. Appropriate dress for field work includes long pants, and warm/dry/sun layers appropriate to the forecast weather. Bring a daypack with food, water, 10 essentials, field guides, notebook, and any personal equipment (e.g., personal dbh tape, clipboard, increment borer). Required field equipment will be provided by the instructor.

## Learning Goals

Broad goals for students completing this course are to:

- Understand the effects of environmental variables and gradients on plant species distribution and ecosystem productivity
- Describe and explain dynamics of forest ecosystems over time including disturbances and succession/structural development
- Learn to identify common trees in the Northern Rockies
- Safely and accurately apply mensuration techniques to quantify forest ecosystem structure
- Evaluate of alternative ecological hypotheses based on interpretation of quantitative analyses

## Learning Outcomes

Students completing this course will be able to:

- Demonstrate and apply best practices in data collection and quality assurance
- Identify and differentiate 15 woody plant species based on diagnostic characteristics
- Differentiate major causes of tree mortality in the field
- Identify 10 common forest pathogens, stem/root rots, and/or insects, and their host tree species
- Use field measurements to describe patterns and explain mechanisms of forest structural development following moderate and high-severity disturbance
- Assess evidence for frequent fires functioning as a stabilizing feedback in dry forests with measurements of forest structure and fuel loadings
- Analyze repeat measurements of permanent sample plots to quantify forest biomass accumulation and carbon stocks
- Explain feedbacks between forests, rivers, and floodplains, including the role of large wood
- Evaluate complex claims about forest management practices

## Readings

There are two required and one recommended texts for this course, all field guides.

### **Required**

Hagle, S.K., Gibson, K.E., and Tunnock, S. 2003. Field guide to diseases and insect pests of northern and central Rocky Mountain conifers. Report No. R1-03-08. (Reprinted in 2013 with minor revisions; B.A. Ferguson, Montana DNRC, ed.) U.S. Department of Agriculture, Forest Service, Northern and Intermountain Regions; Missoula, Montana, and Ogden, Utah. 197 p.

<http://dnrc.mt.gov/divisions/forestry/docs/assistance/pests/fieldguide/complete-field-guide/fg-full-temp.pdf>

Van Pelt, R. 2008. Identifying old trees and forests in eastern Washington. Washington State Department of Natural Resources, Olympia, WA. 166 p.

[https://www.dnr.wa.gov/publications/lm\\_hcp\\_eastside\\_oldgrowth\\_guide.pdf](https://www.dnr.wa.gov/publications/lm_hcp_eastside_oldgrowth_guide.pdf)

### **Recommended**

Kershaw, L., A. MacKinnon, and J. Pojar. 1998. Plants of the Rocky Mountains. Lone Pine Publishing.

**Additional readings will be assigned and made available via the course Moodle page. Read assigned readings before the meeting for which they are assigned.**

## Course Schedule – Fall 2022

Week	Date	Day	Topic	Location
1	8/29	Monday	Forest-river-large wood-floodplain interactions	Kelly Island
2	9/5	Monday	Labor Day Holiday – No class	No class
2/3	9/10	Saturday	Alpine treeline and mycorrhizal fungi	St. Mary’s Peak
3	9/12	Monday	Tree demography and causes of mortality	Potter Trust
3/4	9/17	Saturday	Vegetation structure and composition along environmental and disturbance gradients	Lolo/Lochsa transect
4	9/19	Monday	Forest growth, biomass, carbon	Potter Trust
5	9/26	Monday	Frequent fire regime forests and surface fuels	TBD
6	10/3	Monday	Data analysis lab: biomass, carbon storage	Stone Hall 107
7	10/10	Monday	Data analysis lab: succession and tree dynamics	Stone Hall 107
8	10/17	Monday	Open lab for data analysis and tree/pathogen review	Stone Hall 107
9	10/24	Monday	Practical exam: tree and pathogen identification	Stone Hall 107
9	10/27	Thursday	Elers Koch Lecture, Mark Fiege	ALI Auditorium, Phyllis J. Washington Education Center
10	10/31	Monday	Final paper due: 6 PM	Remote

### Academic Integrity

Plagiarism, cheating, and other misconduct are serious violations of your contract as a student. All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with and follow the [Student Conduct Code](#).

## Assignments and Grading

Grade	% of possible pts.
A	>93%
A-	90.0% - 93.0%
B+	87.0% - 89.9%
B	83% - 86.9%
B-	80.0% - 82.9%
C+	77.0% - 79.0%
C	73% - 76.9%
C-	70% - 72.9%
D	60% - 69.9%
F	<60%

Final grades will be assigned based on the percentage of possible points earned.

Assignments	Due	Pts. possible
Attendance	Always	100
Field trip report: St. Mary's Peak	Sept 19	50
Field trip report: Lolo/Lochsa transect	Sept 26	50
Practical Exam	Oct 24	50
Final paper	Oct 31	100
<b>Total</b>		<b>350</b>
Extra credit: Koch report	Oct 31	30

## Late Assignment Policy

Attendance in this field class is mandatory. Students participating in official University activities (e.g., sports, etc.) will be allowed extensions on assignments and make-up opportunities with terms established on a case-by-case basis and following University policy. Excused absences for non-University activities (e.g., family emergency, medical emergency) will be considered on a case-by-case basis according to University policy. Requests for extensions will only be considered when made at least one working day prior to the assignment deadline. Unexcused late assignments will be accepted up to four days after the original due date. The overall grade of the assignment will be diminished by 20% for each day late. E.g., the highest possible score for a "perfect" assignment turned in 3 days would be 40% of the possible points for an on-time assignment.

## Disability Accommodations

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, [ode@umontana.edu](mailto:ode@umontana.edu), or visit [www.umt.edu/disability](http://www.umt.edu/disability) for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As

your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

#### Covid-19 (updated August 18, 2022)

- The university encourages COVID-19 vaccines and boosters, which are offered for both students and employees at the Health Services Pharmacy inside Curry Health Center.
- Masks are only required inside Curry Health Center and in some medical/research laboratories on campus. This requirement will be clearly posted. Required or not, we respect those choosing to wear a mask to reduce the spread of respiratory viruses.
- COVID testing for students is available at Curry Health Center. For employees, contact your primary care provider or visit a walk-in clinic. Free at-home tests can be [ordered online](#) or there may be tests available through the Health Services Pharmacy, call 243-5171.