

Syllabus: FORS 330 Forest Ecology

E-mail and Moodle are the primary mechanism through which course materials, updates, assignments, news and readings will be disseminated. You are expected to use and check your University of Montana e-mail account.

Instructor

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Meetings

Lectures via Zoom: Tuesday and Thursday 11:00 am – 11:50 pm;
Labs: Tuesday OR Thursday 2:00 pm – 5:20 pm;
Lab locations: Varies. Check Moodle for most recent information.

Course Objectives and Learning Outcomes

Ecology is the 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. In this course, we will focus on factors affecting forest structure and composition, the effects of environmental gradients on plant species distribution, the dynamics of vegetation communities over time, and key ecosystem-level processes such as the cycling of carbon and nutrients.

This course introduces ecological theory and terminology, illustrated with examples from local and regional forest ecosystems. Students will develop their critical analysis ability, and hone the technical communication skills necessary to integrate ecological science into natural resource policies, management plans, and silvicultural and restoration prescriptions.

Students completing the course should be able to:

1. Understand the role of abiotic factors in determining the distribution of species and productivity of forest ecosystems.
2. Develop informed hypotheses about the role of biotic processes in regulation of forest community structure and function.
3. Using measurements of current composition, structure, and abiotic context, describe a forest's past development and disturbances; and speculate about its likely future developmental trajectory, including probable disturbances and their effects.
4. Use field measurements and data analysis to quantitatively describe forest ecosystem conditions and likely ecological factors influencing those conditions.
5. Clearly communicate ecological concepts and ideas verbally and with the written word.

Readings

Readings will be posted on Moodle. There is no required textbook. Read material before the class or lab for which it is assigned. Be prepared to discuss the reading in lecture and lab sessions.

Assignments

Your grade is based on your attendance and participation in all labs, as well as your performance on two exams, four lab reports, a final presentation, and a final paper (your formal final exam). Grading breakdown and due dates are shown on the assignments schedule.

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 the [Student Conduct Code](#), as well as the UM policy on [discrimination, harassment, sexual misconduct, stalking, and retaliation](#).

Disability Accommodations

Students with disabilities may request reasonable modifications by contacting me. The University of Montana assures equal access to instruction for students with disabilities in collaboration with instructors and Disability Services for Students, which is located in Lommasson Center 154. The University does not permit fundamental alterations of academic standards or retroactive modifications.

Late Assignments

Students participating in official University activities (e.g., sports, etc.) will be allowed extensions on assignments with terms established on a case-by-case basis.

Negotiated excused absences for non-University activities (e.g., family emergency) will be considered on a case-by-case basis. Requests for extensions will only be considered when made at least 1 working day prior to the assignment deadline.

Unexcused late assignments will be accepted up to 4 working days (i.e., weekdays **not** course meetings) 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.

FOR 330 Forest Ecology Lecture and Reading Schedule Fall 2020

Date	Day	Topic	Reading
20-Aug	Th	Course introduction	
25-Aug	Tue	Ecosystem structure, composition, pattern, and dynamics	Perry Ch 5
27-Aug	Th	Plant carbon gain exercise	Gurnell 2005
1-Sep	Tue	Plant ecophysiology I: water	McElrone online
3-Sep	Th	Plant ecophysiology II: light	Oliver and Larson Ch 2
8-Sep	Tue	Climate, topography, physiography, orography	
10-Sep	Th	AET/PET and vegetation distributions across the landscape	Stephenson 1998
15-Sep	Tue	AET/PET and vegetation distributions across the landscape	
17-Sep	Th	Experimental design and evidence	Larson et al. 2013
22-Sep	Tue	Primary succession	
24-Sep	Th	Forest structural development: Introduction	Franklin 2002
29-Sep	Tue	Establishment and self-thinning	Perry Ch 12
1-Oct	Th	Competition and self-thinning theory	
6-Oct	Tue	Forest structural development: tree regeneration	
8-Oct	Th	Tree mortality and gap dynamics	Franklin 1987
13-Oct	Tue	Exam 1	
15-Oct	Th	Forest disturbance ecology and disturbance adaptations	Agee 1993
20-Oct	Tue	Fire Ecology I	Sugihara 2007
22-Oct	Th	Fire Ecology II	
27-Oct	Tue	Net Primary Productivity and Carbon Storage	Lutz et al. 2020; Perry ch 15
29-Oct	Th	Long-term change in forest ecosystems	
3-Nov	Tue	Election Day - No Class	
5-Nov	Th	Nutrient cycling	Perry Ch 17
10-Nov	Tue	Nitrogen cycle	Perry Ch 18
12-Nov	Th	Decomposition and mycorrhizae	Perry Ch 11
17-Nov	Tue	Food webs and trophic cascades	Perry Ch 10
19-Nov	Th	Exam 2	
20-Nov	Friday	Final paper due by 5 PM	

FOR 330 Forest Ecology Lab Schedule Fall 2020

Week	Date	Topic
1		
1	20-Aug	No lab: first day of class
2	25-Aug	
2	27-Aug	Species and community distributions: M Trail hike
3	1-Sep	Riparian forest structure and forest-river interactions: Tower Street
3	3-Sep	Kelly Island access
4	8-Sep	
4	10-Sep	Forest structure and age: location TBD
5	15-Sep	
5	17-Sep	Dead wood, fuels, and the forest floor: location TBD
6	22-Sep	
6	24-Sep	Intro to excel, graphing, data management
7	29-Sep	
7	1-Oct	Adiabatic lapse rate calculations
8	6-Oct	
8	8-Oct	Forest structural development discussion
9	13-Oct	
9	15-Oct	Size-density and competition relationships
10	20-Oct	
10	22-Oct	Fuels analysis
11	27-Oct	
11	29-Oct	Fire and fuels discussion
12	3-Nov	
12	5-Nov	No lab: Election week
13	10-Nov	
13	12-Nov	Student presentations
14	17-Nov	
14	19-Nov	Student presentations

FORS 330 Forest Ecology Assignment Schedule Fall 2020

Assignment **Due Date** **Pts. possible** **Pts. earned**

Exams			
Midterm	13-Oct	150	
Second midterm	19-Nov	150	

Individual Lab Reports	Tue. Lab	Th. Lab		
Intro to excel, graphing	29-Sep	1-Oct	50	
Adiabatic lapse rate analysis	6-Oct	8-Oct	50	
Forest structure analysis	20-Oct	22-Oct	50	
Fuels analysis	27-Oct	29-Oct	50	
Lab Attendance/Discussion questions	All	All	120	
Final paper	20-Nov	20-Nov	100	
Final presentation	Varies	Varies	100	

Total

820

Final grades calculated as % of total points possible.

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%