Forest Biology, FES 240

Fall 2016, 4 credits

Lecture:	MWF	10:00-10:50	Crop Science 122
Lab:	T or R	13:00-16:50	always start in Richardson 107

Instructor:	Barb Lachenbruch	barb.lachenbruch@oregonstate.edu	
	Office Hours:	Tuesdays, 9:00-10:30 AM or by appt.	MarketPlace West, near EBGB
TAs:	Elise Heffernan	elise.heffernan@oregonstate.edu	
	Office Hours:	Thursdays, 11:00-noon or by appt.	Richardson, 2nd floor knuckle
	Sarah Greenleaf	sarah.greenleaf@oregonstate.edu	
	Office Hours:	Mondays, 11:00-noon	Richardson 301-E

Course Description:

Structure, function, development and biology of forest vegetation and their relationships to forestry and natural resource applications.

The class covers the following major areas: what are forest communities, how do we characterize them, and how do they change over time; how do plants get and use carbon, water, and nutrients; what are adaptations and natural selection; and what are plants and biogeochemical cycles. We will cover several synthetic topics including forest reaction to disturbance, forest ecosystem services, and wood quality. Five of the labs are conducted in the forest and three of the labs are used for classroom discussions for which students prepare ahead of time,

Prerequisites: None. Familiarity with organismal biology at the high school level expected.

Baccalaureate Core

This course fulfills the Baccalaureate Core requirement for the Perspectives Category "Biological and Physical Sciences." The course meets these requirements by incorporating critical thinking as follows.

- Lectures highlight areas where knowledge is firm as well as gray areas, with the instructor explicitly modeling the process of critical thinking.
- Field labs provide opportunities for students to use the scientific method to compare their observations with what is presented in other course activities.
- Discussion labs (during three lab periods) have activities for students to prepare, communicate, discuss, and synthesize ideas orally and in writing, with feedback.
- Graded lab write-ups include questions that require critical thinking (typically 2-4 pages).

Learning Outcomes

Baccalaureate Core

Students taking a course in this category will:

1. Recognize and apply concepts and theories of basic physical or biological sciences.
   In this course you will generalize biological concepts beyond the tree and forest to other organisms and ecosystems.
2. Apply scientific methodology and demonstrate the ability to draw conclusions based on observation, analysis, and synthesis.
   You will practice scientific methodology, mostly through observations. You will become proficient in organizing and writing scientific reports and interpreting scientific literature.
3. Demonstrate connections with other subject areas.
   You will apply elements of critical thinking and your knowledge of forest biology to complex environmental issues.

Course-Specific

4. Recognize forest structure and function at multiple scales, from the cellular to the ecosystem level.
5. Draw the pathways of water and carbon movement in a typical tree. Explain the responsible processes and the resulting ecological functions.
6. Synthesize and apply information to predict the biological and ecological effects of disturbances including common forest practices and climate change. Describe the responsible mechanisms.
7. Quantify and describe key characteristics of forest structure and composition and recognize their ecological significance.
8. Communicate clearly using proper terms from botany, forestry, and forest biology.

Learning Resources

You have a lecture Canvas site and a lab Canvas site. You need to check them at least a couple of times per week to learn if there are new documents and to review materials. All required and optional readings and other material are available through Canvas.

The lecture site has the following modules (FES_240_001_F2016):

- Syllabus, Schedule, and Contacting Us
- Lecture Write-ups and Lecture Extra Credit
- Exams and quizzes
  - Examples of old exams
  - Exam answer keys
  - Quiz answer keys
- Week 0 (slides; document with outline, what you need to know, and reading assignments)
  - …
- Week 10 (")

The lab site has the following modules (FES_240_010_F2016 or FES_240_011_F2016):

- Week 1 (lab materials, assignments, readings, in some cases examples of good write-ups, etc.)
  - …
- Week 8 (")

Evaluation of Student Performance

The class will be evaluated on the basis of 1000 points: 600 points for the lecture part of the class and 400 points for the lab part:

Assessment	*How many?*	*Points each*	*Total % of grade*
In-class quizzes	5	22 points	11%
Exams	2 midterm, 1 final	120 points	36%
Lecture write-ups	4	20 points	8%
Lecture attendance		50	5%
Lab write-ups	8	50	40%

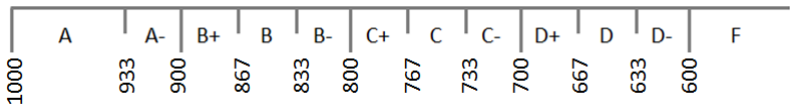
Quizzes and exams show mastery of the subject matter. The questions are derived from "what you may be asked" provided on lecture and lab handouts. They are in-class on Fridays (except the Final Exam, which is in the classroom during Finals Week).

Lecture write-ups are brief responses to specific questions, done at home and turned in on Canvas. Learning Outcomes are on lab and lecture handouts.

Lecture attendance is a gauge of your potential to have received the lecture information. Because the material isn't contained neatly in any one textbook or other resources, attendance is very important. You get attendance credit if you sign in on M and W when the attendance sheet is circulated. There are 20 M, W lectures that are tallied (Week 0 isn't tallied). 17 of those 20 attendances gives you the full 50 attendance points, with a linear decline (of about 2.94 points) below that. Attendance points is 50 – (*n**2.94) where *n* is the number of those 20 M, W weeks 1-10 lectures you signed in for.

Field and discussion labs require write-ups that are due the following week. The field lab write-ups give the student the challenge of reporting, synthesizing, and reacting to the material, following protocol, and producing professional-looking products. Discussion lab write-ups are essays that show the student's critical thinking on topics of importance to natural resource professionals and citizens, and they will require preparation ahead of time, which may carry some of the points.

Grades are assigned according to the scale below with points combined from the two sites.



Incomplete (I) grades (http://oregonstate.edu/registrar/incomplete-grade-policy) will be considered only if the reason is acceptable to the instructor and you are passing at the time of the request. In practice, >80% of the course requirements need to already be met. If you are having difficulties that might prevent completion the coursework, talk to the instructor as early as possible.

Course Policies

Attendance and Participation:

Students are expected to participate in all activities, and arrive and leave on time. You need to attend the lab for which you are registered.

Makeups and Late Write-ups

Makeup exams and quizzes will be given in exceptional circumstances. If you need up to 1 makeup quiz, contact Barb ahead of time. Lab write-ups are due on due-dates and get reduced credit if they are late (but you can take up to three late days for lab assignments, total). It may be possible to get an alternative assignment or an extension for missed assignments, but you must request it promptly with a justification. Go to Barb for for lecture, quiz, and exam issues and to Elise for labs.

Student Evaluation of Teaching

Participation in the Student Evaluation of Teaching (SET) system at the end of the course is optional but very helpful to the instructor and ultimately to students in future classes. Responses are anonymous and unavailable to instructors until after grades are posted. Other feedback (politely delivered) is welcome throughout the course.

Statements of Conduct and Personal and Institutional Responsibilities

Statement Regarding Students with Disabilities: *Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at http://ds.oregonstate.edu. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.*

Statement of Expectations for Academic Honesty (cheating policies): *Students are expected to comply with all regulations pertaining to academic honesty. As outlined on the website, academic dishonesty is defined broadly, and includes cheating, fabrication, assisting, tampering, and plagiarism. See http://studentlife.oregonstate.edu/studentconduct/offenses-0*

Statement of Expectations for Student Conduct (civility): *Students are expected to comply with all regulations pertaining to student conduct. The assumption upon which this Code is based is that all persons must treat one another with dignity and respect in order for scholarship to thrive. As outlined on the website, this expectation covers many aspects of behavior including community standards, civility, accountability, diversity, respect, and truth. See http://studentlife.oregonstate.edu/studentconduct/*

Diversity Statement: *The College of Forestry strives to create an affirming climate for all students including underrepresented and marginalized individuals and groups. Diversity encompasses differences in age, color, ethnicity, national origin, gender, physical or mental ability, religion, socioeconomic background, veteran status, sexual orientation, and marginalized groups. We believe diversity is the synergy, connection, acceptance, and mutual learning fostered by the interaction of different human characteristics.*

Religious Holiday Statement: *Oregon State University strives to respect all religious practices. If you have religious holidays that are in conflict with any of the requirements of this class, please see me immediately so that we can make alternative arrangements.*

Inclusivity, Equity, and Respect for Gender Identification: *If you prefer a name and/or pronoun that is not obvious from the class list, please inform the instructor as soon as possible. You can do so privately via email or in office hours. Everyone associated with the class has the duty to respect and observe gender identification as declared by fellow students.*

		Lecture topic:	Lab activity:	Deadlines:	Due before lab, your lab day:
Wk 0	9/21	A. Intro and Sustainability			
	9/23	A. Critical Thinking			
Wk 1	9/26	A1. Forests and forest structure	Forest composition	Lecture write-up 1	
	9/28	A2. Succession	& structure		
	9/30	A3. Photosynthesis 1		Wk1 Quiz	
Wk 2	10/3	A4. Photosynthesis 2	Tree growth		Lab Wk 1 write-up
	10/5	A5. Phloem, bark, and respiration			
	10/7	A6. Abiotic resources 1		Wk2 Quiz	
Wk 3	10/10	A7. Abiotic resources 2	Carbon sequestration		Lab Wk 2 write-up
	10/12	B1. Growth and meristems	(discussion)		and pre-lab assignment
	10/14	Exam (on A lectures, labs, and activities)		Wk3 Exam A	for Lab Wk 3
Wk 4	10/17	B2. Regulation of plant growth	Invasive case study		
	10/19	B3. Metabolism; Species interactions			Lab Wk 3 write-up
	10/21	B4. Species interactions		Wk4 Quiz	
Wk 5	10/24	B5. How microbes shape forests	Species interactions	Lecture write-up 2	Lab Wk 4 write-up
	10/26	B6. Genes, natural selection, & evolution			
	10/28	B7. Plant reproductive strategies		Wk5 Quiz	
Wk 6	10/31	B8. Tree breeding and seed zones	Assisted migration		Lab Wk5 write-up
	11/2	C1. Plant nutrition	(discussion)		and pre-lab assignment
	11/4	Exam (on B lectures, labs, and activities)		Wk 6 Exam B	for Lab Wk 6
Wk 7	11/7	C2. Nitrogen and biogeochemical cycles	Log decomposition		Lab Wk 6 write-up
	11/9	C3. Hydrologic cycles & remarkable water			
	11/11	*Veteran's Day holiday, no class*			
Wk 8	11/14	C4. Transport when water is plentiful	Wilderness	Lecture write-up 3	Lab Wk 7 write-up
	11/16	C5. Transport when water is scarce	(discussion)		and pre-lab assignment
	11/18	C6. Biomechanics 1		Wk8 Quiz	for Lab Wk 7
Wk 9	11/21	C7. Biomechanics 2			Lab Wk 8 write-up
	11/23	C8. Wood quality	*No lab*		
	11/25	*Thanksgiving holiday, no class*			
Wk 10	11/28	C9. Forest ecosystem services 1		Lecture write-up 4	
	11/30	C10. Forest ecosystem services 2	*No lab*		
	12/2	C11. Disturbance and sustainability again			
Finals	12/5	Exam (mostly on C lectures, labs, and activities but also A and B)		Wk 11 Final Exam	