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	<b>Instructor</b>	<b>Teaching Assistant</b>
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<b>Office Hours:</b>	Tu 1-2 PM, W 12-1 PM	Tu 11-12 PM, W 1-2 PM

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<b>Term:</b>	Spring 2019
<b>Class Meeting Days:</b>	TuTh
<b>Class Meeting Hours:</b>	2-3:15
<b>Class Location:</b>	Natural Resources, Room 140
<b>Lab Location:</b>	NA
<b>Course Credits:</b>	3

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### **Course Overview**

Forest ecology is the science dealing with everything in tree-dominated ecosystems: soil, plants, animals, interactions between organisms, the flow of energy and matter, and the relationship between humans and forests. The components of forests vary across space and change over time—some changes are slow (growth of individual trees, shifts in species composition) and others are rapid (100% tree mortality after a crown fire). Each forest is unique and the myriad of factors that influence forests make it hard to predict future conditions. Forest ecology is complicated because it ties together so many different fields of knowledge: climatology, biology, biogeochemistry, genetics, hydrology, wildlife biology, disturbance ecology, and more. Thinking about how or what a forest is doing and what might happen in the future requires some basic knowledge of these different fields, but also an ability to synthesize information across fields and be comfortable with non-linear thinking and uncertainty.

This course provides an overview of concepts central to forest ecology (e.g., energy budgets, primary production, competition, disturbance, trophic interactions, etc.), with an emphasis on the important role that site conditions and disturbances play in shaping current and future forest conditions. We will review case studies to illustrate how concepts apply to real-world examples, and we will learn to interpret ecological information in graphs. Come with an open and skeptical mind – science is all about questioning assumptions and exploring exceptions to the rules!

### **Course Goals and Objectives**

By the end of this course, students will be able to: (1) describe the components of forest ecosystems and give examples of their interactions, (2) explain the factors that result in huge variability in forest conditions over space and time, (3) integrate knowledge of species life history strategies to develop predictions of how a forest will respond to changes in climate and disturbances (4) assess the strengths and limitations of research

approaches used to understand forest ecosystems, and (5) extend knowledge of forest and disturbance ecology to develop recommendations for forest management under different scenarios. This course will also improve your science processing and communication skills. With the solid foundation of facts and reasoning skills we develop together, you'll be able to walk into a forest and begin answering these questions:

- What is happening in this forest?
- How did it get this way?
- What might happen in the future?

### **Course Prerequisites**

Life320

### **Required Texts and Materials**

**iClickers are required for the course – be sure to bring them to every class** as they are part of your grade. Once you have one, **you must register it otherwise you will not receive iClicker participation points**. You cannot earn iClicker points for lectures you miss.

There is no required textbook for the course. Instead, I selected various supplemental material (journal articles, book chapters, short videos, etc.) to complement each week's subject matter. Supplemental material is available on the course webpage (Canvas). Supplemental material does not duplicate the lectures, so it is important to both attend class and review these items. Exams will include questions covering the supplemental material as well as the lectures.

Excel (or similar software) is required to make graphs for one assignment. Excel is available on all computers in the Library and WCNR Computer Lab. Speak with me if you are having trouble accessing a computer with Excel.

### **Library & Research Help**

The CSU Libraries Help Desk provides basic research and technical assistance either in person at Morgan Library or by phone at 970-491-1841. Virtual assistance is also available via the Libraries' Ask Us chat and email services (<http://lib.colostate.edu/help/ask-us>). Jocelyn Boice is the librarian supporting the Forest and Rangeland Stewardship Department and this course. Contact her for in-depth assistance at: [jocelyn.boice@colostate.edu](mailto:jocelyn.boice@colostate.edu) / 970-491-3882.

### **Important Dates to Remember**

Midterm Exam: Thursday, March 14<sup>th</sup>

Final Paper Due Date: Thursday, April 18<sup>th</sup>

Final Exam: Tuesday, May 14<sup>th</sup>, 6:20 – 8:20 pm

### **Course Schedule** *(subject to change during the course of the semester)*

<b>Week</b>	<b>Topic</b>	<b>Background Material &amp; Important Dates</b>
1. Jan. 22, 24	Introduction Energy & Climate	Annotated Powerpoint
2. Jan. 29, 31	Energy & Climate, Dendrochronology	Allen and Breshears, 1998 ( <i>PNAS</i> )
3. Feb. 5, 7	Water & Forest Ecosystems	Annotated Powerpoint

4. Feb. 12, 14	Forest Water Budgets; Soils	Annotated Powerpoint
5. Feb. 19, 21	Forest Distributions Overtime	Swetnam et al., 1999 <b>Assignment 1 due February 19<sup>th</sup></b>
6. Feb. 26, 28	Plant life history strategies	Christensen, 2014 (For. Ecol. & Mgmt.)
7. Mar. 5, 7	Slow changes in forests (stand development / succession)	<b>Assignment 2 due March 8<sup>th</sup></b>
8. Mar. 12, 14	Rapid Changes in forests (fire)	<b>Midterm Exam, March 14<sup>th</sup></b>
9. Mar. 26, 28	Rapid Changes in forests (beetles)	Romme et al., 2006
10. Apr. 2, Apr. 4	Rapid Changes in forests (disturbance interactions)	<b><i>Draft of Research Paper Section due April 4<sup>th</sup></i></b>
11. Apr. 9, Apr. 11	Rapid Changes in forests (wind)	
12. Apr. 16, 18	Post Disturbance Recovery	<b>Research Paper due April 18<sup>th</sup></b>
13. Apr 23, 25	Plant-Wildlife Interactions	
14. Apr. 30, May 2	Future Forest Distributions & Assisted Migration	McLachlan et al., 2006 ( <i>Conservation Biology</i> ) <b>Assignment 3 due May 2<sup>nd</sup></b>
15. May 7, May 9	Wrap Up: Issues for the future	
Finals Week	<b>Final Exam, Tuesday, May 14<sup>th</sup> 6:20 – 8:20 PM</b>	

### **Basis for Final Grade**

Assessment	Points	Percent of Final Grade
Homework Assignments	200	20%
In-class Activities and Participation	50	5%
Research Paper	25	25%
Background Material – Quizzes/Assignments	100	10%
Midterm Exam	200	20%
Final Exam	200	20%
	1000	100%

Grades will be assigned as A (93-100%), A- (90 - 92%), B+ (88 - 89%), B (83-87%), B- (80 - 82%), C+ (78 - 79%), C (73 - 76%), C- (70 - 72%), D (60-69%), and F (<60%).

**Homework Assignments:** Assignments will enhance your understanding of course material and provide opportunities for improving scientific processing skills and professional writing and collaboration skills. We will generally spend one day working on these assignments in class, although sometimes these assignments will be completed entirely outside of the classroom. There will be 3 assignments over the course of the semester. All assignments must be turned in on canvas.

***In-class Activities and Participation:*** Each class period will consist of either doing in-class activities and/or lectures with iClicker questions asked throughout to assess your knowledge of course concepts. All iClicker questions will be graded for participation only and all in-class activities will be graded for completion only. You will be given two “free” days during the semester, where if you miss any iClicker questions or in-class activities they will not count towards your final grade. Because of this, there will be no opportunities to make-up missed participation points. If you have to miss more than 2 classes for an excused reason (class field trip, sickness, etc.) then please speak with me. If you are missing less than 2 classes you do not need to give me any field trip forms, doctors notes, etc.. This is because everyone is given 2 “free” days, where a 0 participation point for the day doesn’t count towards your grade.

***Background Material:*** There will be assigned background materials (reading, annotated powerpoints, videos) that you will be required to go through before class. It is important that you go through these before class and there will be associated short assignments and/or pop-quizzes for these background materials.

***Research Paper:*** In assigned groups of 4, you will work as a team to write a research paper on a forest type of your choosing. Further details of the research paper are available on canvas.

***Midterm and Final Exam:*** There will be one midterm exam and one final exam. I will provide practice exams, and we will review material in-class before each exam. Exams are approximately 70% short answer and 30% multiple choice.

## **Course Policies**

### **Late Work Policy**

Homework assignments turned in late will be deducted 10% for each day that the assignment is late. It is your responsibility to talk with me if you have any questions about the assignments or their due dates.

### **Extra Credit Policy**

There may be some extra credit opportunities to attend relevant graduate student defenses or seminar series and any available will be announced in class and on canvas.

### **Attendance Policy**

Students need to speak with me at least a week in advance to schedule make-up exams for approved absences (intercollegiate athletics, collegiate club sports and competitions, conferences and workshops, professional activities, unavoidable and important personal commitments, etc.).

Students are expected to attend class and participate in weekly discussions and activities. iClicker questions and in-class activities are graded for participation and completion only and worth 10% of the final grade. See “In-Class Activities and Participation” for further details.

### **Grades of "Incomplete"**

Per university policy, an instructor may assign temporary grade of Incomplete to a student who demonstrates that he or she could not complete the requirements of the course due to circumstances beyond the student's control and not reasonably foreseeable. A student must be passing a course at the time that an Incomplete is requested unless the instructor determines that there are extenuating circumstances to assign an Incomplete to a student who is not passing the course. When an instructor assigns an Incomplete, he or she shall specify in writing using the Department Incomplete Grade Form the requirements the student shall fulfill to complete the course as well as the reasons for granting an Incomplete when the student is not passing the course. The instructor shall retain a copy of this statement in his or her grade records and provide copies to the student and

the department head or his or her designee. (Section I.6 of the *Academic Faculty and Administrative Professional Manual*)

### **Disability Access**

Colorado State University is committed to providing reasonable accommodations for all persons with disabilities. Students with disabilities who need accommodations must first contact Resources for Disabled Students before requesting accommodations from the professor. Resources for Disabled Students (RDS; <http://rds.colostate.edu/home>) is located in room 100 of the General Services Building. Their phone is (970) 491-6385 (V/TDD). Students who need accommodations in this course must contact the professor at the beginning of the semester to discuss needed accommodations.

### **Religious Accommodation**

Participation in official University activities, e.g., an out-of-town athletic event, or special religious observances may provide a legitimate reason for an excused absence. The student is responsible for discussing this with the instructor at the beginning of the semester.

### **Final Exam Policy**

Final examination week is part of the regular semester. Student attendance shall be consistent with University policy.

If a student has three or more final examinations (not classes) scheduled for the same day or if conflicts of examination times occur, the student may negotiate a time change with the instructors involved. If the parties involved cannot find a mutually agreeable time, the Registrar's Office indicates which courses must be changed. **Note:** The Registrar's Office must be notified at least one week prior to Final Examination Week to allow instructors time to make appropriate accommodations. It is the student's responsibility to initiate negotiations.

Any student who has a conflict with the examination schedule must inform the instructor as soon as possible before the examination. If an agreement cannot be reached between the instructor and student as to the appropriateness of a make-up examination the student should appeal to the department head.

<http://www.registrar.colostate.edu/final-exams>

### **Professionalism Policy**

Per university policy and classroom etiquette; mobile phones, iPods, *etc.* **must be silenced** during all classroom and lab lectures. Those not heeding this rule will be asked to leave the classroom/lab immediately so as to not disrupt the learning environment. Please arrive on time for all class meetings. Students who habitually disturb the class by talking, arriving late, *etc.*, and have been warned may suffer a reduction in their final class grade. When emailing the instructor or TA, please include your full name and the course number in your email.

### **Academic Integrity**

The Department of Forest and Rangeland Stewardship takes academic integrity seriously. At minimum, academic integrity means that no one will use another's work as their own. The CSU writing center defines plagiarism this way:

Plagiarism is the unauthorized or unacknowledged use of another person's academic or scholarly work. Done on purpose, it is cheating. Done accidentally, it is no less serious. Regardless of how it occurs, plagiarism is a theft of intellectual property and a violation of an ironclad rule demanding "credit be given where credit is due."

Source: (Writing Guides: Understanding Plagiarism.

<http://writing.colostate.edu/guides/guide.cfm?guideid=17>)

If you plagiarize in your work you could lose credit for the plagiarized work, fail the assignment, or fail the course. Each instance of plagiarism, classroom cheating, and other types of academic dishonesty will be addressed according to the principles published in the CSU General Catalog (under "Academic Integrity/Misconduct: <http://catalog.colostate.edu/general-catalog/policies/students-responsibilities/> .)

Of course, academic integrity means more than just avoiding plagiarism. It also involves doing your own reading and studying. It includes regular class attendance, careful consideration of all class materials, and engagement with the class and your fellow students. Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, we will ask to you sign the CSU Honor Pledge as part of completing all of our major assignments. While you will not be required to sign the honor pledge, we will ask each of you to write and sign the following statement on your papers and exams:

***"I have not given, received, or used any unauthorized assistance."***

### **Title IX Information**

CSU's Student Sexual Harassment and Violence policy, following national guidance from the Office of Civil Rights, requires that faculty follow CSU policy as a "mandatory reporter" of any personal disclosure of sexual harassment, abuse, and/or violence related experiences or incidents shared with the faculty member in person, via email, and/or in classroom papers or homework exercises. These disclosures include but are not limited to reports of personal relational abuse, relational/domestic violence, and stalking. While faculty are often able to help students locate appropriate channels of assistance on campus (e.g., see the CSU Health Network link below), disclosure by the student to the faculty member requires that the faculty member inform appropriate CSU channels to help ensure that the student's safety and welfare is being addressed, even if the student requests that the disclosure not be shared.

For counseling support and assistance, please see the CSU Health Network, which includes a variety of counseling services that can be accessed at: <http://www.health.colostate.edu/>. And, the Sexual Assault Victim Assistance Team is a confidential resource for students that does not have a reporting requirement and that can be of great help to students who have experienced sexual assault. The web address is <http://www.wgac.colostate.edu/need-help-support>.

Source: <http://oeo.colostate.edu/title-ix-sexual-assault>

### **Non-Discrimination Statement**

Colorado State University does not discriminate on the basis of race, age, creed, color, religion, national origin or ancestry, sex, gender, disability, veteran status, genetic information, sexual orientation, gender identity or expression, or pregnancy. The University complies with the Civil Rights Act of 1964, as amended, related Executive Orders 11246 and 11375, Title IX of the Education Amendments Act of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, Section 402 of the Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended, the Age Discrimination in Employment Act of 1967, as amended, The Pregnancy Discrimination Act of 1978, Americans with Disabilities Act of 1990, the Civil Rights Act of 1991, the ADA Amendments Act of 2008, the Genetic Information Nondiscrimination Act of 2008, and all civil rights laws of the State of Colorado. Accordingly, equal opportunity of employment and admission shall be extended to all persons. The University shall promote equal opportunity and treatment in employment through a positive and continuing affirmative action program for ethnic minorities, women, persons with disabilities, and veterans. The Office of Equal Opportunity is located in 101 Student Services. Source: <http://oeo.colostate.edu/non-discrimination-statement>