Fall 9-1-2021

FORS 333.01: Fire Ecology

Kyra D. Wolf
University of Montana, Missoula, kyra.wolf@umontana.edu

FORS 333: Fire Ecology

W.A. Franke College of Forestry and Conservation
University of Montana

LOGISTICS

Time: Tuesday, Thursday, 9:30 – 10:50 am
Physical Meeting Location: Native American Center 105
Required Field Trips: (1) Lolo Peak Fire, Fri. Sept. 24 OR Sat. Sept. 25 (8:30 a.m. – 5:00 p.m.) (2) Mount Sentinel Fire, TBD (during class time)
Moodle Site

INSTRUCTOR

Kyra Wolf (she/her), Ph.D. Candidate
Office: CHCB 443 (Clapp 4th floor middle hallway) or Zoom
Office Hours: Tue/Thu 11-12:30, or by appointment
E-mail: kyra.wolf[at]umontana.edu (Include "FORS 333" in subject)

CORONAVIRUS POLICY

As of August 2021, rates of COVID-19 infection in Missoula county are increasing, and our risk level is classified as red (25+ new cases per day per 100k people). The following policies are in place to mitigate the spread of COVID-19 on campus:

- Mask use is required within the classroom. ***I expect you to wear a tight-fitting mask over both your mouth and nose throughout class***. Noncompliance is a violation of the student conduct code and will result in dismissal from class.
- Mask use is required in vehicles when traveling to field sites as part of class/fieldwork.
- If you feel even a little sick and/or are exhibiting COVID-19 symptoms, please don't come to class and contact the Curry Health Center at (406) 243-4330.
- If you are required to isolate or quarantine, you will receive support in the class to ensure continued academic progress. Let me know ahead of time, and I will record lectures and arrange for a peer to share notes with you.
- UM strongly recommends students get the COVID-19 vaccine. Vaccines are safe and effective and are available at no cost at a variety of locations in Missoula. Please direct your questions or concerns about vaccines to Curry Health Center.
- Specific seating arrangements will be used, and class attendance and seating will be recorded to support contact tracing efforts.
- Drinking liquids and eating food is discouraged within the classroom.
- Please sanitize your hands frequently, avoid congregating before or after class, and remain vigilant outside the classroom to help mitigate the spread of COVID-19.

I recognize that students may have circumstances that put them or their loved ones at high risk for COVID-19. Please get in touch with me and the Office of Disability Equity (ODE) if you are unable to attend in-person classes regularly due to health concerns.

COURSE OVERVIEW

Fire is a dominant ecological process affecting individual organisms, populations, communities, and ecosystems worldwide. To understand the ecology of most terrestrial ecosystems, you have to understand the role that fire plays in that system. Fire is also a useful tool and tightly linked to natural resources, and the stability and predictability of numerous things humans value (e.g., health, property, life). The role of fire in ecosystems is thus often controversial, and balancing goals can be difficult. Understanding the scientific process and the science of fire ecology is a key part of developing and implementing sound management approaches and learning to live with wildfire. Throughout this course we will study fire ecology through three main perspectives:

Fire as a biophysical process: How do physical and biological processes interact to determine when, where, and how fires burn in an ecosystem? How do changes in biophysical components affect the patterns of fire over years, decades, and centuries?

Fire as an ecological process: How does fire interact with other biotic and abiotic components of an ecosystem? How are organisms, communities, and landscapes impacted by fire? How can we quantify the role that fire plays in an ecosystem over different spatial and temporal scales? How does this role vary through time and across space, and what does this imply about contemporary fire activity and expectations for the future?

Fire as a social-ecological process: How does a scientific understanding of fire ecology inform land management policies and practices? How does fire science inform societal and management issues including fuels treatments, salvage logging, fire suppression, and ecosystem resilience in the context of climate change?

Learning Outcomes

By the end of this course, you should be able to:

1. *Describe* the scientific principles at the foundation of fire ecology, and their relevance for management applications and practice.

2. *Describe* and *explain* (i) the biological and physical controls of wildfire, from the scale of a flame to fire regime, and (ii) how wildfire impacts individual organisms, populations, and ecosystems, across time scales of years to millennia, drawing on relevant examples.

3. *Describe* and *compare* historical fire regimes, human impacts and current management challenges, and the ecological role of fire in montane, mixed-conifer, subalpine, and grassland ecosystems of the West, and other select ecosystems globally.

4. *Analyze* and *interpret* real-world datasets to *test* ecological hypotheses, and *communicate* your findings in written text.

5. *Evaluate* information on fire ecology and management from diverse sources, including the scientific literature, media outlets, and social media, and *formulate* an informed opinion.

Course Organization

We will cover the following topics, roughly in this order, through presentations, on-line exercises, guest lectures from experts in the field, and field activities to study fire effects and post-fire revegetation. See Moodle for the current course calendar.

Theme	Topics
Fire as a biophysical process	Biological and physical controls of fire The fire regime concept Fire danger and links to fire ecology and management *Current topics:* Fire and climate change
Fire as an ecological process	Fire effects on plants, animals, and ecosystems **Current topics*: Fire, Climate, and Changing Forest Fire history: characterizing and reconstructing fire regimes Fire ecology of ponderosa pine and Douglas-fir forests Fire ecology of subalpine forests Fire ecology mixed-conifer forests *Current topics:* Fire and Ecological Feedbacks Global fire ecology: grasslands, rain forest, boreal forest, tundra, and/or more
Fire as a social-ecological process	Fire as a social-ecological process Indigenous fire use and management *Current Topics*: Fire, Resilience, and Ecosystem Change

*Guest presentation by topical expert

Prerequisites

FORS 230, "Fire Management & Environmental Change" OR an introductory course in ecology, botany, biology, dendrology, or biogeography.

Course Materials

"Fire Ecology in Rocky Mountain Landscapes" by W. L. Baker, published in 2009 by Island Press. You may find this book at the UM bookstore or from a number of on-line book sellers.

Weekly course materials will come from (1) primary literature from scientific journals and research reports from the USFS or other relevant agencies; (2) other media formats, including videos, podcasts, and pieces from reputable media outlets; (3) and presentations that are accessible on a range of digital devices (and which include text, videos, and podcasts). All materials will be linked to from the Moodle shell.

Computer Access for Moodle and Synchronous Class Activities

For 2021, you absolutely need reliable internet access to keep up to date with course materials, successfully access and hand in assignments, and receive important update and/or participate in discussions via Moodle. For in-person meetings, we will also use laptop computers, tablets, or cell phones (any way to access the internet), as available, for in-class activities. *Important: If you do not have access to any of these devices, please contact your instructor asap.*

Socrative: We will use the on-line app Socrative, to ask questions and solicit feedback from students participating in class. When prompted by your instructor or TA to "log in to Socrative" you should navigate in a web browser to www.socrative.com. You DO NOT need to sign up for anything, so resist clicking on the "Sign up for free" tab. Instead, click the "Login" tab that is usually in the upper right of the screen. From there, choose "Student Login" and when prompted for the "Room Name" enter "FIREECOLOGY21". When prompted to enter your name, enter your name as "Last Name, First Name." When Socrative exercises are complete, we download them and use them in part to quantify attendance and student participation. Entering your last name first helps me sort names in a way that matches our course roster.

Assignments and Exams

Weekly Learning Content Questions

Reading, watching, or listening to the assigned material by the noted due date is an important part of the course. If no due date is listed, the due date is by the end of the relevant Moodle section (which has an associated date). It is important that you complete this content by the noted deadline, to be able to support in-class activities.

During most weeks, questions for the following week's readings will be posted on Moodle by Tuesday. Your answers to these questions are typically due by 9 am on the following Thursday via Moodle and take the majority of students around 30-60 minutes to complete. For any short-answer or essay questions, it is strongly recommended that you write your answer in a text document first, and then paste this into Moodle. Failing to do so inevitably leads to lost work. Save these questions, as they are a good preview of what you can expect to see on the exams.

Answers will be evaluated based on a four-category scale:

Full Credit	10 points	Demonstrates that the student read and thought about the material and put effort into responses
Good	8 points	Demonstrates that the material was completed
Pass	6 points	Some of the materials likely completed
Fail	0 points	No evidence that the material was completed

Try to make your answers readable and the meaning clear; however, this is "informal" writing, and spelling and grammar do not count toward your grade. The goal is for you to think about the material and restate concepts in your own words, which helps you learn, and to demonstrate to me that you have completed the reading. If you draw on external sources beyond that week's reading (which is not required), include parenthetical citations, for example (Baker, 2009), with full citations or links at the bottom. Avoid simply quoting text, as this does not demonstrate comprehension of the material or concept; rather, synthesize and communicate ideas in your own words.

Fire in the News

Students will be required to post at least two features in the "Fire in the News" forum, and provide their reaction and informed assessment. Details will be on Moodle.

New in 2021: Students will also create their own news item on a current fire-related topic of their choice. This could be a short video, podcast, or written article, and should be accompanied by a

well-crafted tweet or Twitter thread. We will work as a class to come up with a set of criteria for evaluating these items, and students will share the final product with their classmates.

Fire Effects Field Trip and Project

The course includes a one-day field trip to the 2017 Lolo Peak Fire, where students observe fire effects and collect data on post-fire tree regeneration and re-vegetation. There is also an in-class trip to the Mount Sentinel fire of 2020 to observe grassland fire dynamics and post-fire recovery.

Students will develop and write an individual research project based on class data. The report will be submitted in two stages, beginning with an outline and figures during Week 10 of the class, and the final version during Week 15. Feedback on the first submission should be incorporated into the final version. Details and the grading rubric located on Moodle will be discussed in class.

Exams

Two exams will cover materials from class periods, readings, and any field trips preceding the exam. *Important: Material not covered in class but assigned in course content may be included in the exams.* The final exam is cumulative but will focus on the second half of the course. Exams will consist of true/false, multiple choice, and short answers and/or essay questions.

Exam 1: Tuesday October 5th
Final Exam: Tuesday, Dec. 14th

Course Grade

This class is offered for a traditional letter grade only; it is not offered under the credit/no credit option. Grades are based on individual performance and progress throughout the semester. Final grades will be based on the following point distribution:

Assignment	Points
"Fire in the News" forum & project	150
Weekly class participation	100
Weekly content questions (lowest one dropped)	100
Fire effects project	200
Mid-term Exam	200
Final Exam	250
TOTAL	**1000**

Break points between number grades and percentages will be based on the table below.

A = ≥ 93%	A- = 90-92%	
B+ = 87-89%	B = 83-86%	B- = 80-82%
C+ = 77-79%	C= 73-76%	C- = 70-72%
D + = 67-69%	D = 63-66%	D- = 60-62%
F = <60%		

Tips for success

- **Participate in class** by: attending/viewing, taking notes, focusing, and asking questions.

- **Read** the assigned readings. I will not cover all material in the assigned readings in class, yet the content is a key part of the course. Give yourself the needed time to complete the readings and other assignments prior to class.
- **Keep up to date with the class** by checking the calendar and assignments on Moodle.
- **Be curious**: ask questions inside and outside of class (i.e., during office hours) if you do not understand the material presented.
- **Write legibly and clearly**: Give yourself enough time to proof read before submitting formal writing assignments. Communicate professionally with your instructor and classmates. Take advantage of office hours and the Writing Center as needed.

COURSE POLICIES

Class Expectations

Cell phones and mini-computers

Please reserve use of electronic devices for in-class exercises or note-taking. I expect you to refrain from texting, browsing, or checking e-mail during class. If you feel you need to engage with your electronic device, please leave the classroom.

Class participation

The "Class participation" portion of your course grade is based in part on class attendance. During-class exercises and attendance will contribute to participation.

Assignment due dates

Due dates are firm. Late assignments will not be accepted unless you have extenuating circumstances *and* have made arrangements with me at least 48 hours prior to the due date. This includes missing an exam: *there are no make-up exams* without prior arrangement.

Out-of-class communication

I encourage you to see me if you have questions about course material or assignments. If you have questions about your grade or your standing in the course, please meet with me during office hours or make an appointment. I am happy to help outside of class, particularly when students demonstrate an interest in learning, but to do so, I ask that you follow these guidelines:

> Coming to office hours (on Zoom) is the best way to get questions answered. If you need to email me, please do the following: *(a) include "FORS 333" in the subject line, (b) write in complete sentences, with proper grammar, and (c) sign the e-mail with your full name.* Reply times will vary and may be up to 48 hours. Expect a response of "see me during office hours" if it is a content-related question or requires a complex answer.

Requests for extensions on assignments or grade changes *must* go through email, in order to have written documentation and ensure consistency and fairness for all students. If you think that a grade on an assignment was incorrect, you have one week to submit a written request for review. This must include a clear justification of why you think the grade should be changed.

Classroom environment

Students at University of Montana are diverse in many ways, including race, gender, age, religion, preparedness, and mobility. Help create a respectful learning environment by honoring all student contributions and expressing your views in ways that do not diminish other students' perspectives.

Academic Honesty, Plagiarism, and Student Conduct

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 adhere to the Student Conduct Code.

Academic dishonesty of any form is unacceptable and will be taken seriously by the instructor, the College, and the University of Montana. This includes plagiarism, when you copy materials from other sources without citing the source or copy someone's work, and cheating, copying material from other students during tests or quizzes. In both cases, you will fail the assignment/exam and the information will be passed on to the Dean of Students Office. It is your responsibility to be familiar with, and adhere to, the University's definition of plagiarism.

Accessibility Modifications

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE, formerly Disability Services for Students). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, ode@umontana.edu, or visit 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.

Course Withdrawal Deadlines

Important dates restricting opportunities to drop a course are listed on the Fall 2021 Official Dates and Deadlines calendar and summarized below:

September 20 (5 pm): Last day to drop classes on Cyberbear with refund.

September 21 – November 1 (5 pm): Drop requires instructor and advisor approval, in CyberBear, $10 fee from registrar's office, and student will receive a "W" on transcript.

November 2 - December 10: Students are only allowed to drop a class under very limited and unusual circumstances, requiring instructor, advisor, and Dean's approval; $10 fee applies. A "WP" of "WF" will appear on the transcript for dropped classes. No refunds.