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# FORS 230: Fire Management & Environmental Change

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

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## LOGISTICS

**Time:** Mon., Wed., Fri., 9:00 – 9:50 am

**Location:** Forestry Building (FOR) 106

**Web Site:** <https://moodle.umt.edu>

## INSTRUCTORS\*

**Carl Seielstad, Associate Professor**

**\*Lead:** Weeks 1-5, 14-16

**Office:** CHCB 441

**Office Hours:** Mon. 10:00-11:30, Tue., 10:00-12:00

**E-mail:** [carl@firecenter.umt.edu](mailto:carl@firecenter.umt.edu)  
(Include "FORS 230" in subject)

**Phone Number:** (406) 243-6200

**Philip Higuera, Associate Professor**

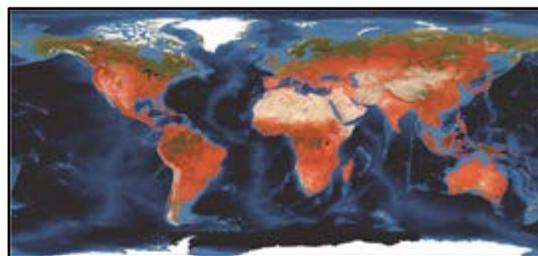
**\*Lead:** Weeks 6-13

**Office:** CHCB 460b

**Office Hours:** Tue., 2:30-4:00, Wed., 12:30-2:00

**E-mail:** [philip.higuera@umontana.edu](mailto:philip.higuera@umontana.edu)  
(Include "FORS 230" in subject)

**Phone Number:** (406) 243-6337



Satellite-detected fires from NASA's MODIS Active Fire Detections dataset.

## TEACHING ASSISTANT

**Enzo Martelli-Moya, Graduate Student**

**Office:** CHCB 460

**Office Hours:** Wed. 11:00-1:30, Thu., 3:00-4:30

**E-mail:** [enzo.martellimoya@umontana.edu](mailto:enzo.martellimoya@umontana.edu)  
(Include "FORS 230" in subject)

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## COURSE OVERVIEW

Fire is an immense topical area with aboriginal roots: native peoples from across the globe have used fire to manipulate landscapes for thousands of years. From these roots, complex fire management practices have evolved. In North America, fire has replaced timber as the dominant activity on public lands, and federal agencies regularly spend nearly half of their annual budgets trying to extinguish fires. A warming climate and increased human development in and near wildlands implies that fire will remain a dominant societal issue in the foreseeable future.

This class offers an introduction to wildland fire and its role as a transformative process in the environment. We will cover an overview of fire fundamentals, fire ecology, human impacts, and fire management practices in the United States and abroad. The class is targeted at students new to fire and is intended to provide a basic understanding of first principles to students in subjects including natural resource management, ecology, and environmental sciences, while serving as a stepping-off point for those interested in further study of fire.

## Learning Outcomes

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

1. Describe the processes of combustion and heat transfer.
2. Discuss how weather, fuels, and topography interact to control fire behavior.
3. Understand fire regimes and first- and second-order fire effects.
4. Articulate the basic role of fire in affecting stand structure, and species composition in western North American forests.
5. Comprehend and articulate the evolution of fire policy and the organization and structure of fire management in the United States.

### Course Organization

We will cover the following topics, roughly in this order, through class presentations, class exercises, and guest lectures from experts in the field. See Moodle for the current course calendar.

Theme	Topics
<b>Fire as a Physical Process</b>	<i>Fire in the Earth System</i> <i>Combustion</i> <i>Heat Transfer</i> <i>Fire Propagation</i>
<b>Fire Behavior</b>	<i>Fire behavior fundamentals: fuels, weather, and topography</i> <i>Wildland fire behavior models: history, limitations, future development</i> <i>Fire Climatology and Fire-climate Relationships</i>
<b>Fire as a Biological Process</b>	<i>Pyrogeography: global climate, vegetation, and fire; fire ecology</i> <i>Plants and fire: fire and plant traits, fire regimes, fire and evolution</i> <i>Fire and fauna: direct and indirect effects, fire and evolution</i> <i>Fire as an ecosystem process: erosion, nutrient cycling, soils, and climate</i> <i>Fire and anthropogenic environmental change: land use, management, climate change, invasive species, and altered fire regimes</i>
<b>Anthropogenic Fire</b>	<i>Fire and Humans: aboriginal fire, cultivated fire, fire narratives</i> <i>Fire in the Anthropocene</i> <i>Fire management: history, policy, institutions, and organizational structure</i>

## Textbook and Readings

Scott, A. C., D. M. J. S. Bowman, W. J. Bond, S. J. Pyne, and M. E. Alexander. 2014. *Fire on Earth: An Introduction*. John Wiley & Sons.

The required textbook is available via the [University of Montana Book Store](#), and one copy will be placed on reserve at the Mansfield Library. We may also read literature from scientific journals and technical reports, which will be accessible through the “Course Readings” folder on Moodle. The first several chapters of the textbook are also available on Moodle, to give students time to purchase the text book.

## Moodle, Socrative, and Computer Access

You need reliable internet access to keep up to date with course materials, to successfully access and hand in assignments, and to access course readings via Moodle. *The course calendar is on Moodle and is updated throughout the semester, so be sure to check the calendar weekly.*

We will use the free, on-line software Socrative for in-class activities that require students to work individually or in groups to and answer questions on course material. If you do not have way to access the internet from in class (e.g., phone, tablet, or computer), please let the TA know; we can accommodate students without on-line access using paper.

## Assignments and Assessments

### Weekly Readings

Readings are an essential part of the course and are assigned in the course calendar, at a rate of approximately 30-50 pages a week. Multiple readings are presented (from top to bottom) in the order in which you should read them (for Mon., Wed., and Fri. class, respectively). It is important to complete the readings before class to be able to participate and do well on quizzes.

### Exercises

Five exercises on the topic of fuels, fire behavior, fire effects, fire history metrics, and fire management, will collectively comprising 30% of your final grade. Each exercise should require 2-4 hours and will be due approximately 2-3 weeks after assigned.

### Quizzes

Four quizzes collectively comprise 40% of your final grade. They will cover material from the lectures and readings from the unit immediately preceding them. We will not necessarily cover all of the material in the readings directly in lectures, but the material in the readings is important and will be part of what is tested on in quizzes.

### **Final Exam: Thursday May 7<sup>th</sup>, 2020, 10:10-12:10, in class**

The final exam will be cumulative, covering material from the entire semester. The exam will consist of combinations of short answer, multiple choice, matching, and true/false questions.

## Grading

This class is offered for a traditional letter grade only; it is not offered under the credit/no credit option. Final grades will be based on the following point distribution:

Assignment	Points
Participation	50
Exercises (5 x 60)	300
Quizzes (4 x 100)	400
Final Exam	250
<b>TOTAL</b>	<b>1000</b>

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

A = $\geq 93\%$	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

1. **Participate in class** by: attending, taking notes, focusing, and asking questions.
2. **Read** the assigned readings. We 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 prior to class.
3. **Keep up-to-date with the class** by checking the calendar and assignments on Moodle. It is imperative that your University e-mail works and that you can use Moodle. We will update Moodle frequently with class materials.
4. **Be curious:** ask questions in class and take advantage of office hours if you do not understand the material presented.
5. **Write legibly and clearly:** Give yourself enough time to proof read before submitting written assignments. Communicate professionally with your instructor and classmates.
6. **Utilize resources that are here to help you:** (a) office hours, (b) [The Office for Student Success](#) also offers several programs for students looking for help with study skills, including time management and note taking. Programs vary for different students and are listed on their web page. Finally, materials and assignments in the course assume students are familiar and proficient with math concepts through algebra. If you are not, consider seeking additional assistance from [The Math Learning Center](#).

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## COURSE POLICIES

### Communicating with your instructors and TA: office hours and e-mail

Our office hours and e-mail addresses are listed at the top of this syllabus, and on the “logistics” sidebar of the Moodle site for this course. [Please e-mail us using the link on Moodle](#).

*Coming to office hours is the preferred way to get questions answered.* We encourage you to see your instructor or TA if you have questions about course material or assignments. If you have questions about your grade or your standing in the course, you need to discuss that with one of your instructors, not your TA.

*If you send e-mails with questions about the course, you need to do the following so that the e-mail is read and understood:* (a) e-mail from your University e-mail account; (b) send the e-mail to both instructors and cc' your TA; (c) include "FORS 230" in the subject line (because we teach multiple courses, and we don't necessarily know which course you are referring to), (c) write in complete sentences, with proper grammar; and (d) sign the e-mail with your name.

Reply times will vary and may be up to 60 hours. [Clicking on the “E-mail your instructors...” link in the “logistics” sidebar on Moodle will do \(b\) and \(c\) for you automatically.](#)

When you try to conduct business with us in the moments before class starts or when we're not expecting you, we often feel rushed and cannot give your question or issue the attention it deserves. It is much better if you make an appointment to discuss your concerns, or see your instructor during office hours or immediately after class.

## **Class expectations**

Please respect your fellow student's learning experience. Do not talk among yourselves during class (but feel free to raise your hand to ask a question), arrive on time, and do not leave class early or pack up before class is over.

### ***Cell phones and mini-computers***

Please turn off electronic devices during class, unless they are being used for an in-class exercise. We expect you NOT to be texting, browsing, or checking e-mail during class. If you feel you need to engage with your electronic device, please remove yourself from the classroom.

### ***Attendance***

Attendance is expected and contributes to the "Class participation" portion of your course grade. We do not always post class presentations, and we strongly encourage you to take notes during class. Absences will not be excused unless you have extenuating circumstances *and* have contacted us at least 48 hours in advance of the class.

### ***Assignment due dates and make-ups***

*Due dates are firm.* Late assignments are not accepted unless you have unusually extenuating circumstances *and* have made arrangements with us at least 60 hours prior to the due date. This includes missing a quiz or exam: *there are no make-up quizzes or exams* without prior arrangement.

### ***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 of Forestry and Conservation, 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](#).

### ***Students with Disabilities***

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and [Disability Services for Students \(DSS\)](#). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with DSS, please contact DSS in Lommason 154 or 406.243.2243. We will work with you and DSS to provide an appropriate modification.

**Course Withdrawal Deadlines**

Important dates restricting opportunities to drop a course are listed on the [Spring 2020 Official Dates and Deadlines calendar](#) and summarized below:

**February 3<sup>rd</sup>:** Last day to drop classes on Cyberbear with refund.

**February 4<sup>th</sup> – March 24<sup>th</sup>:** Drop requires form with instructor and advisor signature, \$10 fee from registrar's office, and student will receive a "W" on transcript.

**March 25<sup>th</sup> – May 1<sup>st</sup>:** Students are only allowed to drop a class under very limited and unusual circumstances. Drop requires advisor, instructor, and Dean's signatures, \$10 fee, and student will receive a "WP" or "WF" on transcript.