Wildfire Science and the Urban Interface
California State University, San Marcos

Course Outline

BIOL 391
FIRE ECOLOGY

COURSE DESCRIPTION

An interdisciplinary review and study of wildfires as a natural and man-made biophysical and ecological process. Examines the costs and benefits of wildfires and prescribed burns as a tool for land management, and the implications for endangered species, habitat, soils, air quality, and watersheds. Covers fire history, and fire in the context of global environmental change. Discusses current issues in fire ecology in the Western U.S. and globally, including readings and evaluations of recent scientific literature. *Prerequisites: Biol 210, 211 or enrollment in the Bachelor of Science in Wildfire Science and the Urban Interface program.*

REQUIRED MATERIALS

We will use the textbook Sugihara, N. et al. 2006. Fire in California's Ecosystems, First Edition. University of California Press. 612 pages. The comprehensive book was selected because it was written by many of the foremost authorities on the subject and is an ideal text and reference tool that synthesizes our knowledge of the science, ecology, and management of fire. The text covers the basics of fire ecology (including an historical overview of fire, vegetation, and climate), overviews of fire as a physical and ecological process, and reviews the interactions between fire and the physical, plant, and animal components of the environment. The text also examines fire management in California, including both Native American and post-European settlement; discusses current issues related to fire policy and management, including air quality, watershed management, invasive plant species, native species, and fuel management; and considers the future of fire management.

Supplemental readings may be provided throughout the semester, either uploaded to the course website, provided by a link to online materials, and/or emailed directly to students.

COURSE WEBSITE

This course is a fully-online course. As such, we will rely on the Cougar Courses course management software for all course interactions, materials, assignments, discussions, and exams. Recorded lectures, course notes, assignments, supplemental readings, and exams will all be found there. There will also be an online forum for discussion boards and

group conversations. Once you have successfully enrolled in the class you will have access to the course website at: **http://cc.csusm.edu**. Log in with your email user name and the same password as your email account.

GRADING POLICY

Your grade will be based on performance on two exams (one midterm and one final), quizzes, assignments, and participation. While we want each student to achieve the highest grade possible in the course, please remember that long-standing policy considers a grade of A to be indicative of outstanding achievement; available only for the highest accomplishment, while a grade of B indicates a praiseworthy performance; definitely above average. Of course a C is considered average. This course does not use particular numerical scores that must be achieved to get a specific letter grade. Instead, letter grades will be assigned to scores after each assignment on the basis of the class average and our judgment regarding class performance.

Most of your grade will be based on exams. We encourage you to keep up with the course pace, and develop virtual study groups with other members of the class. Discussion and interaction can be an important part of understanding the topic. Your grades will be posted on the course website as they become available, for assessment of your progress throughout the semester. Please be sure to contact the instructor early on if you are having any difficulty in the course.

Exams and quizzes: To understand the issues related to fire ecology, you need both to commit basic factual information to memory, and to apply concepts to new problems. Periodic quizzes will test your recall of factual information from lectures and readings. Each exam will test your ability to apply course information and materials to questions and case studies to solve and communicate answers to real-world problems. Assessments will be open book and notes. The midterm and final exam will be comprehensive, covering all information up to that point in the course. Open book exams are not easy; you will not have time to look up everything you need to know. Exams will only be offered at a specific time. Also exams are timed, meaning that students will have to complete the exam in the period allotted, with the site automatically shutting off after time expires.

To make sure that everyone is keeping up with the readings and lectures, periodic quizzes will be given throughout the semester, mostly to judge your understanding of the subject matter, and to encourage timely preparation. Like exams, quizzes will be timed, and you will be automatically shut off after time expires.

Assignments: You will provide critical assessment and periodic assignments for this class that will teach you to apply the techniques and information you are learning. Details of each assignment will be covered in separate instructions. In general, assignments are designed to allow us to evaluate your critical thinking skills, problem solving abilities, and original thought. We will also want to ensure that written materials are of the highest quality and standard. To prepare you for assignments, textbook, online readings and/or other supplemental materials may be provided. These materials cover the concepts pertinent to the assignment.

Participation. Topics discussed in this course may be unfamiliar, albeit extremely important for your development as scientists and wildfire/WUI professionals. Regardless of whether you could conceivably pass the class without participating with the instructor or other students, every student learns more if he or she actively engages with the material, which you cannot do if you don't participate. Therefore, participation points will be based on attending online forums and discussions along with real-time discussion as appropriate.

Final Grades will be calculated using the following:

Assignments	**20 points**	**A = 100-95**	**C- = 73-70**
Quizzes	**20 points**	**A- = 90-94**	**D+ = 69-67**
Participation	**10 points**	**B+ = 89-87**	**D = 66-64**
Midterm Exam	**50 points**	**B = 86-84**	**D- = 63-60**
Final Exam	**100 points**	**B- = 83-80**	**F < 59**
		C+ = 79-77	
TOTAL	**200 points**	**C = 76-74**	

Notes on Grading

Please check the grade for each assessment for errors. Any concerns (errors, disputes) be brought to our attention within **2 weeks**. Please double check your grade against the posted grades recorded on the website.

CLASS POLICIES

Getting help: Students often struggle with various concepts, particularly during the early stages of a class. If you are having difficulty, there are several ways to get help:

- Come to virtual office hours. In addition to my posted office hours, you are welcome to set up a meeting by appointment. Office hours are greatly under-used by students at this campus, don't be shy about making use of them!
- Review sessions. Before each exam, I will offer a review session and summary materials that can assist in studying and preparing.

Email notification: If I need to e-mail announcements about the class, I will use your CSUSM account. If you do not regularly monitor your CSUSM e-mail, please set up a forward from your campus e-mail to whatever account you regularly use.

Academic dishonesty: Academic misconduct has rarely been a problem, and warning you about the consequences may seem unnecessary and perhaps even offensive. The University takes standards of integrity very seriously. We are very strict with regard to cheating and plagiarism, and will respond accordingly. Please review the information on students' rights and responsibilities

Any work you submit for grading must represent your own thinking, and must be in your own words. Any cheating or plagiarism that is detected will be reported to the Dean of Students. You are expected to know what plagiarism is – refer to

https://microsites.csusm.edu/plagiarism-tutorial/ for a tutorial on plagiarism (including "unintentional" plagiarism) and how to avoid them. The instructor reserves the right to apply appropriate penalties for cases of academic dishonesty detected, up to and including assigning an F for the class. All cases of academic dishonesty will be reported to the Dean of Students.

Making up missed work: This class involves a great deal of online interaction and work. As a fully online course, the internet becomes the virtual classroom. It is critically important that students put in the time to view lectures, attend discussion sessions (as appropriate), and review all course materials. Missed assignments, exams or quizzes will receive zeros, unless arrangements are made in advance, or unless documentation of a serious and compelling reason is presented for the absence.

Disabled student services: Students with disabilities who require academic accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (DSS). This office is located in Craven Hall 4300, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive accommodations should meet with me during my virtual office hours or in a more private setting in order to ensure your privacy.

All-University writing requirement: As a three unit course, each student will complete a rigorous series of written assessments that will encompass at least 2,500 words (approximately 10 pages). The student will be responsible for original work, ideas, and concepts, ensuring that all written materials submitted are of the highest quality and standard. Assessment of this material will cover spelling and grammar, content, clarity, and organization. Evaluations will also address critical thinking skills, problem solving, and original thought.

LEARNING OUTCOMES

After taking this course you should be able to:

- Demonstrate interdisciplinary knowledge, theories, and research to apply to fire ecology and land management strategies related to fire risk and fuels management
- Demonstrate an understanding of the physical process of wildfires on the ecosystem, and the issues and risks related to human introduced fires and fuels treatment within the ecosystem
- Demonstrate an understanding of how different ecosystems and habitats respond to fires, and how fire can be a natural element in those systems
- Understand how the natural and physical environment both benefit and are impacted by fire, and the role that fire plays with regard to invasive species, endangered/sensitive species, and conservation planning
- Demonstrate the ability to discuss and evaluate fire ecology issues both verbally and written and apply perspectives, concepts, and theories related to problems, threats, risks, and environmental impacts

RECOMMENDATIONS FOR STUDENT SUCCESS

You will find that the content in this class is familiar to you, but can certainly be challenging. However, the coursework will reinforce the principles of the scientific process, critical thinking, and problem solving. Students who are successful in this class are those that employ the following practices.

- Dedicate yourself to learning the course material – read and review.
- Never let yourself get behind on the materials or assignments.
- Use the help that is offered (instructor office hours, review sessions, and discussion boards).
- Study for exams! While exams are open book/notes, you really need to know the materials; you will not have enough time to go through all your notes and materials to answer questions.
- Turn in all assignments quizzes, etc. – small points add up quickly and are very destructive of your grades
- Work in study groups. Or study alone. But whatever you do, study!

CLASS SCHEDULE

Unit 1 Climate and Weather

Unit 2 Physical Process of Fire

Unit 3 Fire as an Ecological Process

Unit 4 Wildfires and the Environment:
Watersheds, Soil, Air, and Water Quality / MIDTERM

Unit 5 Case Studies and Bioregions

Unit 6 Wildfires and Plant/Animal Interactions

Unit 7 Fire, Invasive Species, At-Risk Species,
and Ecosystem Management

Unit 8 Fire and Fuel Management / FINAL EXAM