

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

Course Outline

FIRE 489 RESEARCH METHODS AND DESIGN

COURSE DESCRIPTION

Capstone experience focused on a foundation in scientific research, research design, effective communication practices, and interview skills. Integrates interdisciplinary approaches to research in the wildfire and wildland urban interface. Emphasizes fundamental principles and practices of scientific method, research ethics and responsible conduct, and the organization of scientific inquiry in institutions of higher learning. Prepares students for independent research experience in FIRE 499. *Prerequisite: BIOL 216 or consent of instructor.*

By its very nature, this course is designed to provide a summative evaluation of a student's experience and education at CSUSM. It not only assesses previous learning in the major, but also provides a forum that allows an instructor to assess the student's overall learning experience. The course provides an opportunity for students nearing the end of their degree to demonstrate that they have achieved the goals for learning established by degree program. This course is designed to be student-centered and student-directed, requiring the command, analysis, and synthesis of theoretical and applied knowledge and skills.

REQUIRED MATERIALS

We will use the textbook Gliner, J. et al. 2016. Research Methods in Applied Settings: An Integrated Approach to Design and Analysis (3rd Edition). Routledge Taylor and Francis Group. 620 pages. This text teaches students how to plan, conduct, and write a research project and select and interpret data through its integrated approach to quantitative research methods. Although not a statistics book, concepts about which technique to use when and how to analyze and interpret results are reinforced. The course and text book are organized around the steps of conducting a research project, with an emphasis on analysis of current journal articles and reports.

Students also learn about approaches to research (in preparation for their own independent study), discussing randomized experimental, quasi-experimental, comparative, associational, and descriptive projects. Students are also provided online resources available through Routledge Publishers with supplemental presentations, critical thinking exercises, and discussion topics. Additional 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

By the end of the semester, students will have identified a topic for their independent study (FIRE 499), and completed a proposal that will be submitted to the instructor for final review and approval. This will serve as the foundation for the student's independent study experience and final report, presentation, or poster in the following semester.

Your grade will be based on performance on assignments, participation, and a final project proposal. This course is graded on a Credit/No Credit basis. In order to receive credit for the course, students will have to complete all material, and demonstrate an understanding and knowledge equivalent to a C grade in the course. This course does not use particular numerical scores that must be achieved to receive credit.

Passing the course is largely based on the successful completion of the final project. We encourage you to keep up with the course pace, and develop virtual discussion groups with other members of the class. Discussion and interaction can be an important part of understanding the topic. Please be sure to contact the instructor early on if you are having any difficulty in the course.

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 is mandatory, with students attending online forums and discussions along with real-time discussion as appropriate.

Final Project:

In consultation with the instructor, students will identify a topic for library or applied research on wildfires and/or the wildland urban interface (WUI). OPTION A: Literature Review: In-depth reading and researching of the literature on current issues in wildland fire/WUI. Student must produce a paper with supporting citations that summarizes the current state of knowledge on the topic. OPTION B: Original research project in the developed in collaboration with a faculty member. In this course, the student will produce a project proposal that will provide the foundation for the FIRE 499-Independent Study course.

A goal of the final paper/proposal is to assess the student's cumulative theoretical and applied interdisciplinary knowledge, providing an opportunity to apply this knowledge to a real-world setting through critical thinking, analysis, and the scientific method.

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!

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.

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 students should be able to:

- Apply basic concepts from previous courses in their major to broad issues in the field of wildfires and the urban interface
- Demonstrate an ability to understand, research, and evaluate a problem or issue
- Evaluate literature and reports for their scientific and statistical rigor
- Apply basic principles of statistics and research design to developing a proposal and project
- Demonstrate the ability to discuss and evaluate issues both verbally and written and apply perspectives, concepts, and theories related to societal problems, threats, risks, and safety 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	Defining a Project: Hypothesis Testing and Research Questions
Unit 2	Research Design: Linking Methods and Analysis
Unit 3	Literature and Citations: Developing a Foundation, Defining Your Contribution
Unit 4	Defining the Scope, Understanding Limitations, and Power Analysis
Unit 5	Presenting Your Research: Visualizing Information, Data Analysis, and Interpretation
Unit 6	Ethics, Biases, and Human Subjects Protocols
Unit 7	Effective Writing and Presentations
Unit 8	Bringing it Together: Research Proposals and Grant Writing