California State University San Marcos • NEW COURSE • FORM C FIRE 402

ORIGINATOR'S SECTION:

1. College:

☐ **CHABSS** ☐ **CoBA**
☐ **CoEHHS** ☒ **CSM**

Desired Term and Year of Implementation (e.g., Fall 2008):

Fall 2019

2.Course is to be considered for G.E.? (If yes, also fill out appropriate GE form*) ☐ Yes ☒ No

3. Course will be a variable-topics (generic) course? ☐ Yes ☒ No
("generic" is a placeholder for topics)

4. Course abbreviation and Number:* FIRE 402

5. Title: ***(Titles using jargon, slang, copyrighted names, trade names, or any non-essential punctuation may not be used.)***
Fire Behavior, Fuels, and Resource Management

6. Abbreviated Title for PeopleSoft:
(no more than 25 characters, including spaces)
Fire Bhvr & Rsrce Mgt

7. Number of Units: 3

8. Catalog Description: ***(Not to exceed 80 words; language should conform to catalog copy. Please consult the catalog for models of style and format; include all necessary information regarding consent for enrollment, pre- and/or corequisites, repeated enrollment, crosslisting, as detailed below. Such information does not count toward the 80-word limit.)***

Course uses GIS and analytical tools to understand and evaluate fire behavior prediction systems, with attention to assumptions, limitations, uncertainty, sensitivity, and probability. Students learn how fuels, land use, and environmental conditions influence combustion and behavior by using fire models, with discussion on how resource deployment and land management influences outcomes of an incident. Students will learn the tools and approaches for inventory and management of fuels for wildland fires over large, diverse areas in forests, woodlands, shrubland, and grasslands. *Prerequisite: FIRE 101 and FIRE 105.*

9. Why is this course being proposed?

Course is part of the curricula for the newly proposed Bachelor of Science in Wildfire Science and the Urban Interface

10. Mode of Instruction*
For definitions of the Course Classification Numbers: ***http://www.csusm.edu/academic_programs/curriculumscheduling/catalogcurricula/DOCUMENTS/Curricular_Forms_Tab/Instructional%20Mode%20Conventions.pdf***

Type of Instruction	Number of Credit Units	Instructional Mode (Course Classification Number)
Lecture	3	C2
Activity		
Lab		

11. Grading Method:*
☒ Normal (N) *(Allows Letter Grade +/-, and Credit/No Credit)*
☐ Normal Plus Report-in-Progress (NP) *(Allows Letter Grade +/-, Credit/No Credit, and Report-in-Progress)*
☐ Credit/No Credit Only (C)
☐ Credit/No Credit or Report-in-Progress Only (CP)

12. If the (NP) or (CP) grading system was selected, please explain the need for this grade option.

13. Course Requires Consent for Enrollment? ☐ Yes ☒ No

☐ Faculty ☐ Credential Analyst ☐ Dean ☐ Program/Department - Director/Chair

14. Course Can be Taken for Credit More than Once? ☐ Yes ☒ No
If yes, how many times? (including first offering)

15. Is Course Crosslisted: ☐ Yes ☒ No

If yes, indicate which course and check "yes" in item #22 below.

16. Prerequisite(s): ☒ Yes ☐ No FIRE 101 and FIRE 105

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* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair

17. Corequisite(s): ☐ Yes ☒ No

18. Documentation attached:
☐ Syllabus ☒ Detailed Course Outline

19. If this course has been offered as a topic, please enter topic abbreviation, number, and suffix:* N/A

20. How often will this course be offered once established?* Once per academic year

PROGRAM DIRECTOR/CHAIR - COLLEGE CURRICULUM COMMITTEE SECTION:
(Mandatory information – all items in this section must be completed.)

21. Does this course fulfill a requirement for any major (i.e., core course or elective for a major, majors in other departments, minors in other departments)? ☒ Yes ☐ No

If yes, please specify:
Fulfills requirement for new Bachelor of Science in Wildfire and the Urban Interface

22. Does this course impact other discipline(s)? (*If there is any uncertainty as to whether a particular discipline is affected, check "yes" and obtain signature.*) ☒ Yes ☐ No

If yes, obtain signature(s). Any objections should be stated in writing and attached to this form.

Geography Discipline	See Attached (Signature)	(Date)	✓ Support	____ Oppose
Biology Discipline	(Signature)	2/6/17 (Date)	✓ Support	____ Oppose

SIGNATURES : (COLLEGE LEVEL) :

Matt Rahn, PhD, JD (1. Originator (please print or type name))	November 20, 2016 (Date)
(2. Program Director/Chair)	1/10/17 (Date)
(3. College Curriculum Committee)	5/5/17 (Date)
(4. College Dean (or Designee))	5/9/17 (Date)

(UNIVERSITY LEVEL)

5. UCC Committee Chair	Date
6. Vice President for Academic Affairs (or Designee)	Date
7. President (or Designee)	Date

Trailer ——

Office of Academic Programs PS Banner: Catalog Revised 3/28/2007

* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair.

RP ——

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

Course Outline

FIRE 402
FIRE BEHAVIOR, FUELS, AND RESOURCE MANAGEMENT

COURSE DESCRIPTION

Course uses GIS and analytical tools to understand and evaluate fire behavior prediction systems, with attention to assumptions, limitations, uncertainty, sensitivity, and probability. Students learn how fuels, land use, and environmental conditions influence combustion and behavior by using fire models, with discussion on how resource deployment and land management influences outcomes of an incident. Students will learn the tools and approaches for inventory and management of fuels for wildland fires over large, diverse areas in forests, woodlands, shrubland, and grasslands.

REQUIRED MATERIALS

We will use the following materials (available online and on the course website):

- Heinsch, F. A.; Andrews, P. L. 2010. BehavePlus fire modeling system, version 5.0: Design and Features. General Technical Report RMRS-GTR-249. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station.
- Andrews, P. L. 2009. BehavePlus fire modeling system, version 5.0: Variables. General Technical Report RMRS-GTR-213WWW Revised. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station.
- Andrews, P. L.; Bevins, C. D.; Seli, R. C. 2008. BehavePlus fire modeling system, version 4.0: User's Guide. General Technical Report RMRS-GTR-106WWW Revised. Ogden, UT: USDA Forest Service, Rocky Mountain Research Station.
- Andrews, P. L.; Heinsch, F. A.; Schelvan, L. 2011. How to generate and interpret fire characteristics charts for surface and crown fire behavior. General Technical Report RMRS-GTR-253. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station.

Students will also need access to the latest GIS software (ArcGIS), which will be available as part of the software available through the CSUSM website for students enrolled in this course. Students will also have access to BEHAVE PLUS, an add on software extension for ArcGIS.

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 fire behavior, fuels, and resource management, you need to commit basic factual information to memory, and apply concepts to new problems. Students are expected to have a basic foundation in GIS skills and statistics. 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 through data analysis and interpretation. 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:

- Apply basic concepts from GIS analysis, statistics, and other scientific disciplines and courses, to understanding fire risk, fuels management, community design, and the wildland urban interface (WUI)
- Understand how GIS and related analysis tools can be used to inform policy, regulation, management, decision-making, and incident command decisions
- Identify and apply appropriate practices, tools, tactics, and strategies to avoid, minimize, and mitigate the risks of fires in the wildland and wildland urban interface
- Apply scientific methods and statistical/mathematical concepts in order to demonstrate problem-solving and leadership skills within your field of study

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	GIS Basics: Review of Spatial Analysis and Remote Sensing
Unit 2	Fire Weather and Environmental Influence
Unit 3	Assessing Hazards and Fuel Models
Unit 4	Understanding Fire Behavior through GIS
Unit 5	Modeling Wildfires and the Urban Interface: BEHAVE
Unit 6	Using GIS to Improve Situational Awareness and Attack Effectiveness
Unit 7	Predicting the Behavior for Fuels Management, Initial and Extended Attack
Unit 8	Using GIS to Improve Situational Awareness and Communication

Laurie Schmelzer

From: Greig Guthey
Sent: Thursday, January 19, 2017 2:58 PM
To: Laurie Schmelzer; Matthew Rahn
Subject: Re: Wildfire Science course

HI Laurie

Please write on the forms that I reviewed the course and support it, and then print out and attach this email to the package that you are sending to academic programs. I thought I had emailed this yesterday but perhaps the email did not go through.

Thanks

Greig Tor Guthey
Associate Professor of Public Policy and Planning & Geography Coordinator
Department of Liberal Studies
homepage: http://www.csusm.edu/liberalstudies/faculty/greig_guthey.html
geography: http://www.csusm.edu/liberalstudies/geography.html
food project: http://www.csusm.edu/liberalstudies/Food_Project.html

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From: Laurie Schmelzer
Sent: Thursday, January 19, 2017 2:32 PM
To: Greig Guthey
Subject: Wildfire Science course

Hello,

Please find attached a new course form for FIRE 402, *Fire Behavior, Fuels & Resource Management*, that requires approval by a faculty member affiliated with the geography curriculum. The Curriculum Committee is just starting to review these documents so please let me know if you have any questions or concerns for the committee and/or originator. When you are ready to sign, I will walk the original over to SBSB.

Thanks,
Laurie

Laurie Schmelzer, M.Ed.
Student Services Professional
Dean's Office
College of Science & Mathematics

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