

COURSE SYLLABUS
NRES 454 - FIRE BEHAVIOR AND FUELS
Spring 2022

Meeting Time and Location:

Section 1: **Lecture:** Wednesday 6:00-7:50pm

Room: Synchronous online class

Instructor:

Steven R. Miller

Office hours: By appointment

Office location: On line or by phone

Phone: 386-937-0554

E-mail address: stmiller@uwsp.edu

Course Purpose & Description: The purpose of this course is to provide you with an intermediate to advanced understanding of the fire environment and how topography, weather and fuels influence fire behavior. The course is divided generally into 3 units; fuels, weather, and behavior with sub-units under each element. Note that elements of weather relationships will be incorporated into the units on fuels and fire behavior as well a separate section on weather. The unit on fuels will involve fuel characterization, live and dead fuel moisture, weather relationships, with emphasis on fuel models and fuel modeling. The unit on weather will cover basic processes, atmospheric stability, wind systems and sources of weather data. The unit on fire behavior will explore the combustion process, properties of fire and how the fire environment affects spread and behavior. It will also cover estimation methods and basic calculations for characterizing and predicting fire behavior. While there are no traditional labs, there will be exercises and projects that will reinforce skills. **This class requires simultaneous enrollment in the S-290 Intermediate Wildland Fire Behavior on-line version.**

Course Objectives, Learning Outcomes and Dispositions:

Objectives:

To facilitate student learning and understanding about the fire environment – fuels, weather and topography and their respective contribution to varying fire behavior. To give students practical experience in characterizing fuels, weather conditions and resulting fire behavior. To equip students with an understanding of fuel models and their use in fire behavior modeling. To develop understanding of factors that contributes to extreme fire behavior and how that impacts safety and tactical approaches to wildland management.

Learning Outcomes:

Students will;

- 1) be able to identify and describe the characteristics of the fire environment; topography, fuels and weather and how these elements interact and influence wildland fire behavior,*
- 2) learn to assess fuel characteristics and describe how weather interacts to influence fuel availability,*
- 3) be able to characterize, calculate and predict wildland fire behavior,*
- 4) learn the causes of extreme fire behavior in relation to the fire environment,*
- 5) develop skill in understanding the application of fire behavior models to wildland situations,*
- 6) learn to interpret weather, fuels and topographic information to project fire behaviors and identify potential hazard areas.*

Dispositions:

Students will appreciate the variability in the fire environment and thus the complexity of fire behavior and its prediction.

Students will value data accuracy and the best methods to achieve accuracy for behavior prediction. Students will respect the situations that lead to propagation of extreme fire behavior.

Required Textbook(s):

There is no textbook in the traditional sense, however, a number of National Wildfire Coordinating Group publications and other required readings will be provided through Canvas.

Assignments and Class Activities:

Weekly reading assignments are generally on the course schedule. You are expected to read assignments before class and come prepared to discuss the material. You are expected to keep up with equivalent work in the S-290 on line version. Lecture course materials and quizzes can include material from S-290. Assignments will reference fuel models and Behave outputs. **The final project will be a scientific paper outlining how the student believes fire behavior contributed to bad outcomes in a case study for a wildfire or prescribed burn (list to be provided by the instructor).**

Attendance: Your participation in the on-line course will be important. You will also need to keep current in the equivalent sections of S-290 as quizzes and exams may cover information from both sources. If you must miss an exam, or a quiz for illness or other emergency **you must email me before that exam or quiz.** *Make-up exams for excused absences only.*

Grading Policies / Procedures / Scale:

THREE exams will be given. Each exam will only cover material since the previous exam. The last exam will be given during finals week. The exams over each of the units will compose 60% of the final grade. Exams will be a combination of multiple choice, short answer and matching. Homework assignments given in lecture will be counted like a quiz grade. Quizzes with constitute 15% of the grade. At least four short quizzes will be given during the course. They may or may not be announced and some may be take-home. The lowest quiz grade will be dropped. Twenty percent of your grade will be from the two project reports. The remaining 5% will be from discussion participation.

GRADING	WEIGHT	Grade Scale			
		Mean Score	Letter Grade	Mean Score	Letter Grade
Mid-term Exam 1	20%				
Mid-term Exam 2	20%	100-93	A	77-73	C
Final Exam	20%	92-90	A-	72-70	C-
Quizzes & Homework	15%	89-88	B+	69-68	D+
Discussion	5%	87-83	B	67-60	D
Project	20%	82-80	B-	<60	F
	100%	79-78	C+		

Student Responsibilities:

UWSP values a safe, honest, respectful, and inviting learning environment. In order to ensure that each student has the opportunity to succeed, we have developed a set of expectations for all students and instructors. This set of expectations is known as the *Rights and Responsibilities* document, and it is intended to help establish a positive living and learning environment at UWSP. Click here for more information:

<http://www.uwsp.edu/stuaffairs/Pages/rightsandresponsibilities.aspx>

Academic integrity is central to the mission of higher education in general and UWSP in particular. Academic dishonesty (cheating, plagiarism, etc.) is taken very seriously. **Don't do it!** The minimum penalty for a violation of academic integrity is a failure (zero) for the assignment. For more information, see the UWSP "Student Academic Standards and Disciplinary Procedures" section of the *Rights and Responsibilities* document, Chapter 14, which can be accessed here:

<http://www.uwsp.edu/stuaffairs/Documents/RightsRespons/SRR-2010/rightsChap14.pdf>

Materials that you use in your report that are not your own must be credited with a source. This includes photo credit for photographs that are not your own.

Students With Disabilities:

The Americans with Disabilities Act (ADA) is a federal law requiring educational institutions to provide reasonable accommodations for students with disabilities. For more information about UWSP's policies, check here:

<http://www.uwsp.edu/stuaffairs/Documents/RightsRespons/ADA/rightsADAPolicyInfo.pdf>

If you have a disability and require classroom and/or exam accommodations, please register with the Disability and Assistive Technology Center and then contact me at the beginning of the course. I am happy to help in any way that I can. For more information, please visit the Disability and Assistive Technology Center, located on the 6th floor of the Learning Resource Center (the Library). You can also find more information here: <http://www4.uwsp.edu/special/disability/>

EMERGENCY SITUATIONS:

The following guidance for appropriate response in *Emergency Situations* is excerpted from the Risk Management Preparedness web page:

“In the event of a *medical emergency*, call 911 or use red emergency phone located (list location). Offer assistance if trained and willing to do so. Guide emergency responders to victim.

In the event of a *tornado warning*, proceed to the lowest level interior room without window exposure at (list primary location for shelter closest to classroom). See www.uwsp.edu/rmgt/Pages/em/procedures/other/floor-plans for floor plans showing severe weather shelters on campus. Avoid wide-span rooms and buildings.

In the event of a *fire alarm*, evacuate the building in a calm manner. Meet at (state logical location to meet 200 yards away from building). Notify instructor or emergency command personnel of any missing individuals.

Active Shooter – Run/Escape, Hide, Fight. If trapped hide, lock doors, turn off lights, spread out and remain quiet. Follow instructions of emergency responders.

See UW-Stevens Point Emergency Management Plan at www.uwsp.edu/rmgt for details on all emergency response at UW-Stevens Point.”

University of Wisconsin-Stevens Point College of Natural Resources

Principles of Professionalism

The College of Natural Resources at the University of Wisconsin – Stevens Point prepares students for success as professionals in many fields. As a professional, there are expectations of attainment of several personal characteristics. These include:

Integrity

Integrity refers to adherence to consistent moral and ethical principles. A person with integrity is honest and treats others fairly.

Collegiality

Collegiality is a cooperative relationship. By being collegial you are respecting our shared commitment to student education through cooperative interaction. This applies to all involved in the process: students, staff, faculty, administration and involved community members. You take collective responsibility for the work performed together, helping the group attain its goals.

Civility

Civility refers to politeness and courtesy in your interactions with others. Being civil requires that you consider the thoughts and conclusions of others and engage in thoughtful, constructive discussion to express your own thoughts and opinions.

Inclusivity

Inclusivity requires you to be aware that perspective and culture will control how communication is understood by others. While many values are shared, some are quite different. These differences in values should be both considered and respected.

Timeliness

Timeliness is the habit of performance of tasks and activities, planned in a way that allows you to meet deadlines. This increases workplace efficiency and demonstrates respect for others' time.

Respect for Property

Respect for property is the appreciation of the economic or personal value an item maintains. Maintaining this respect can both reduce costs (increase the operable life of supplies and equipment) as well as demonstrate respect for others rights.

Communication

Professional norms in communication require that you demonstrate the value of your colleagues, students, professors or others. The use of appropriate tone and vocabulary is expected across all forms of communication, whether that communication takes place face to face, in writing or electronically.

Commitment to Quality

Quality is the ability to meet or exceed expectations. By having a commitment to quality, we intend to provide a learning environment that is conducive to learning. Intrinsic to this commitment to quality is defining expectation (committed to in a syllabus through learning outcomes), implementation (with quality control in place) and assessment (where meeting of learning outcomes is determined).

Commitment to Learning

Learning is a lifelong process. By being committed to learning you are providing a model for all to follow. This model is not only professor to student but involves all combinations of people within our university and broader community

Adherence to this compact is required of the faculty and staff of the College of Natural Resources and of all students enrolled in College of Natural Resources courses.

