

Wildland Fire Ecology and Management Syllabus

Description:

Wildland Fire Ecology and Management provides students with basic knowledge of the impacts fire has on forest environments; how the environment influences fire behavior; how wildland fires are suppressed; and how fire is used as a land and vegetation management tool. Knowledge of the influences of weather on fire behavior is critical to the use of fire as a management tool and for safe and efficient fire suppression. The course will also provide students with the knowledge and training to qualify as a basic wildland firefighter (FFT2 - Red Card). Extended laboratory sessions will provide practice in fire behavior prediction, prescribed burning techniques, and fire control methodology. Class materials can be found on Scholar and even more links and pictures at <http://www.cnr.vt.edu/for2514/>

Class Times and Locations:

Lecture: T, Th, 11:00-11:50 a.m., 218 Cheatham Hall (JCH)
Lab: T, 2:00-5:50 p.m., 133 Cheatham Hall (JCH)

Instructor: Dr. Shep Zedaker, 228E JCH, 231-4855, zedaker@vt.edu
Office Hours: Tue, Thu 6:00-8:00 a.m., or by appointment

Teaching Assistant: Bobby Bernier, bernierm@vt.edu

Learning Objectives:

1. Evaluate the impacts of wildland fire on soil, water, and vegetation resources.
2. Learn how weather, topography, and fuel independently and collectively influence fire behavior.
3. Determine safe practices and techniques for wildland fire suppression.
4. Introduce the wildland fire incident command system and its effectiveness for control.
5. Learn the techniques and constraints involved in the safe and efficient use of prescribed fire as a land and vegetation management tool.

Background and Justification:

Fire is a natural and prevalent force shaping wildland ecosystems. Wildfires burn, on average, over 4 million acres annually in the U.S. Wildfires and the damage they cause have increased in intensity because: (1) past fire suppression policies have allowed the accumulation of fuel in the form of fallen leaves, branches, and excessive plant overgrowth in forest and wildland areas; (2) changing weather patterns across the U.S. have brought increasingly dry, hot weather; and (3) increased residential development in the wildland/urban interface has led to tremendous property losses. In 2007, 9.5 million acres burned in the U.S., an area roughly equal to the Virginia Coastal Plain from I-95 to the Atlantic Ocean. People are the main cause of wildland fire. For example, in 1995 there were 9,974 wildfires caused by lightning and 120,045 wildfires caused by humans. Before European colonization of North America, indigenous people started thousands of fires in Virginia each year and no one put them out. Extended dry periods let fires burn for months and the burned area covered hundreds of thousands, or perhaps

even millions, of acres. This course provides CNR students with an introduction to fire ecology, behavior, use, and suppression.

Prerequisites or Corequisites: BIOL 1105 or 1106; CHEM 1035, or equivalent.

Texts and Special Teaching Aids:

Brown, J. K., and J. K. Smith (eds.). 2000. Wildland fire in ecosystems: Effects of fire on flora (Chs. 1, 2, 4). USDA For. Serv. Gen. Tech. Rep. RMRS-GTR-42-Vol 2. 257p. Available on the web at http://www.fs.fed.us/rm/pubs/rmrs_gtr042_2.pdf.

NWCG. 2006. Introduction to Wildland Fire Behavior (S-190), Student Workbook. National Wildfire Coordinating Group Pub. NFES 2901. (purchase in class)

NWCG. 2003. Firefighter Training (S-130), Student Workbook. National Wildfire Coordinating Group Pub. NFES 2730. 203p. (purchase in class)

NWCG. 2001. Smoke Management guide for prescribed and wildland fire. NFES 1279.

Virginia Department of Forestry. 2009. Prescribed fire smoke management guide. 127p. PDF can be found on the class Scholar site & web site.

Rothermal, R. C. 1983. How to predict the spread and intensity of forest and range fires. National Wildfire Coordinating Group. PMS-436-1, NFES 1573. Excerpts. 161p. Available on the web at: <http://www.cnr.vt.edu/for2514>

Wade, D. D., and J. D. Lunsford. 1989. A guide for prescribed fire in southern forests. USDA For. Serv. Tech. Pub. R8-TP 11 (NFES #2108) 56p. (Available on the web at <http://www.bugwood.org/pfire>, although some of the forms that are in the book are not on the web.)

Student Evaluation:

The grade (points) for this course will be determined by two midterm exams (40%), a final exam (25%), and lab exercises (35%). The exams will include material covered during lecture periods and in assigned readings, and will cover the material tested in the standard NWGC S-130, S-190, and I-100 courses.

Qualifications:

A 75% grade on the NWGC S-130, S-190, and I-100 tests, and a passing time on the pack test, will qualify students as basic wildland firefighters (FFT2 – Red Card). An 80% score on the Virginia Prescribed Burn Manager’s Exam is necessary to be certified as a burn manager.

If you are a person with a disability and desire any assistive devices, services, or other accommodations to participate in this class, please contact Shep Zedaker, 228 Cheatham, 231-4855, zedaker@vt.edu, during business hours of 8 a.m. to 5 p.m. to discuss accommodations.

Lecture Topics

Topic	Proportion	Reading(s)
<i>Fire Ecology:</i> Fire History in North America Impacts on Plants and Plant Communities Impacts on Soil Atmospheric Impacts Impacts in the Urban Interface	20%	Brown and Smith
<i>Fire Behavior Factors:</i> Topography General Winds and Cold Fronts Thunderstorms and Local Winds Relative Humidity and Fuel Moisture Atmospheric Stability Indicators of Problem and Extreme Fire Behavior	25%	NFES 2901
<i>Fire Suppression:</i> Fire Safety Personal Preparedness Organization Use of Tools and Equipment Firing Devices Use of Water Suppression Techniques Securing the Control Line Fire Orientation – Maps and Compass Scouting, Patrolling, and Communicating Hazardous Materials Awareness Fire Shelter Use Watch Out Situations/Fire Orders Wildland-Urban Interface	30%	NFES 2730
<i>Incident Command System:</i> Objectives Structure Procedures	10%	NFES 2439
<i>Prescribed Burning:</i> Objectives Weather and Fuels Constraints Firing Techniques Smoke Management Planning and Evaluation	15%	NFES 1279 Wade & Lunsford VDOF, Smoke Mgmt.

Lab Topics (Tentative)

Week	Date	Topic
2	9/1	Fire Ecology: Effects on Vegetation and Forest Structure
3	9/8	Fuel Loading
4	9/15	Fire Weather Observations and Fuel Moisture
5	9/22	Predicting Fire Behavior I
6	9/29	Predicting Fire Behavior II
7	10/6	Suppression Tools, Firing and Line Construction
8	10/13	Use of Water and Pumps
9	10/27	Prescribed Burn Planning
10	11/3	Prescribed Burn Planning
11	11/10	Prescribed Burn Planning
12	11/17	Urban Interface Risk Assessment