FIRE 219 Course Outline as of Fall 2015

CATALOG INFORMATION

Dept and Nbr: FIRE 219 Title: INTERMED WILDLAND FIRE
Full Title: S-290 Intermediate Wildland Fire Behavior
Last Reviewed: 2/22/2021

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	0.50	Lecture Scheduled	0	1	Lecture Scheduled	0
Minimum	0.50	Lab Scheduled	32.00	1	Lab Scheduled	32.00
		Contact DHR	0		Contact DHR	0
		Contact Total	32.00		Contact Total	32.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 0.00 Total Student Learning Hours: 32.00

Title 5 Category:	AA Degree Applicable
Grading:	P/NP Only
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:
An intermediate course designed to provide the student with wildland fire behavior knowledge applicable for safe and effective wildland fire management activities. Upon successful completion, students will be awarded a S-290 certificate from the State Board of Fire Services .

Prerequisites/Corequisites:
Course Completion of FIRE 71

Recommended Preparation:

Limits on Enrollment:
S-190 or equivalent

Schedule of Classes Information:
Description: An intermediate course designed to provide the student with wildland fire behavior knowledge applicable for safe and effective wildland fire management activities. Upon successful completion, students will be awarded a S-290 certificate from the State Board of Fire Services . (P/NP Only)
Prerequisites/Corequisites: Course Completion of FIRE 71
Recommended:

Limits on Enrollment: S-190 or equivalent
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Spring 2020	Inactive:	
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Describe the characteristics and interaction of fuels, weather, and topography on wildland fire behavior, fireline tactics, and safety.
2. Describe the causes of extreme fire behavior (long range spotting, crowning, and firewhirls) developing due to weather, fuels, and/or topography.
3. Interpret, document, and apply wildland fire behavior and weather information.

Objectives:
Upon completion of the course, students will be able to:

1.Identify the various components of the fire environment.
2.Describe the influence of topography on fire behavior.
3.Describe the types and characteristics of fuels and their influence on fire behavior.
4.Describe the different weather process in the atmosphere that influence fire behavior.
5.Describe the influence of temperature and humidity on fire behavior and their relationships with each other.
6.Describe the factors that affect atmospheric stability and their relationships with each other.
7.Describe the factors that affect wind conditions and the influence they can have on wildland fire behavior.
8.Identify the types and uses of products available to observe and predict weather.
9.Describe the importance and frequency of conducting weather observations.
10.Demonstrate the correct use of a Belt Weather kit.
11.Describe the moisture thresholds and weather factors affecting the various fuel types.
12.Describe the factors that contribute to and the characteristics of extreme fire behavior.
13. Demonstrate the ability to gauge fire behavior and use it to guide fire line decisions.

Topics and Scope:

1. The Fire Environment
 a. Components of wildland fire environment
 b. Methods of heat transfer
 c. Methods of mass transport of firebrands on wildland fire
 d .Relationship between flame height/length and relationship to fireline intensity
 e. Primary environmental factors affecting ignition, fire intensity, and rate of spread
 f. Relationship between intensities and their environments
 g. Behavior of wildland fires using standard fire behavior terminology
2. Topographic Influences on Wildland Fire Behavior
 a. Standard features of a topographic map
 b. Topography
  i. How it affects fuels and their availability for combustion
  ii. How it affects direction and rate of spread
 c. How changes in fuels and topography can provide full and partial barriers
 d. Slope percent
  i. How it can be determined or estimated in the field
3. Fuels
 a. Fuel characteristics
 b. Four dead fuel timelag categories used to classify fuels
 c. Fuel Model Concept
4. Basic Weather Processes
 a. Structure and composition of the atmosphere
 b. Define weather and list its elements
 c. Sun-Earth radiation budget and Earth's heat balance
 d. Factors affecting temperature
 e. Greenhouse Effect
 f. Temperature lag and their effects
5. Temperature and Humidity Relationships
 a. Temperature Definitions, Characteristics and Variations
 b. Effects of Variables
6. Atmospheric Stability
 a. Relationship among atmospheric pressure, temperature, density and volume
 b. Temperature lapse rate
 c. Effects of atmospheric stability
 d. Types of temperature inversions, lifting processes
 e. Elements of a thunderstorm
 f. Visual indicators to describe stability of the atmosphere
 g. Principles of Cloud Groups
7. Wind Systems
 a. Wind definitions and effects
  i. General winds
  ii. Local winds
  iii.Typical diurnal slope and valley wind patterns
  iv. Critical winds and their impact
 b. Ways in which topography alters wind patterns
 c. Calculations for wind speed
8. Keeping Current with the Weather
 a. Types, purpose and elements of Predictive Service Products
 b. Types purpose and elements of National Weather Service Products
 c. Importance of Incident Meteorologists (IMET) and Fire Behavior Analysis (FBAN)
9. Observing the Weather
 a. When, how often and where to take weather observations

b. Importance of field observers
c. Use and maintenance of belt weather kit
10. Fuel Moisture
a. Definitions, methods, and relationships of live fuel
b. Effect of precipitation and soil moisture
c. Timelag concept and categories
d. Moisture of extinction
11. Extreme Wildland Fire Behavior
a. Common denominators of fire behavior on tragedy wildland fires
b. Extreme fire behavior characteristics
c. Crown fire development
d. Factors that contribute to spotting problem
e. Probability of ignition
f. Firewhirls, wind-driven and plume dominated fires
12. Gauging Fire Behavior and Guiding Fireline Decisions
a. Safety and suppression decisions
b. Calculating the size of safety zones
c. Changes in fire behavior effecting firefighter safety, identifying the “next big change”
d. Fire behavior prediction tools

Assignment:

1. Classroom participation
2. 2-3 individual activities
3. 2-3 group activities
4. 3-4 written homework assignments
5. Final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written Homework	Writing 10 - 15%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework, classroom activities	Problem solving 5 - 10%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Skills demonstration	Skill Demonstrations 5 - 15%

Exams: All forms of formal testing, other than skill performance exams.

multiple choice summative exam	Exams 60 - 70%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and Participation	Other Category 5 - 10%

Representative Textbooks and Materials:
S-290 Student workbook
S-290 Student CD-ROM
NFES 2894 Flame Field Guide
NFES 2165 Fireline Handbook Appendix B (PMS 410-2)
NFES 1574 Aids for Determining Fuel Models
NFES 1077 Incident Response Pocket Guide (PMS 461)