***Reedley College*** *– Natural Resources/Forestry/Wildland Fire Technology*



**Course:** NR 44 – Section 56152

**Title:** Wildland Fire Technology

Thursday – 1:00 to 4:50 p.m.

**Dates:** January 13, 2020 to May 22, 2020

**Room:** FEM 8

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**Syllabus**

**Instructor:** Adam Hernandez

**Office Telephone:** (559)638-0300 ex. 3496

**Email:** adam.hernandez@reedleycollege.edu

**Office Location:** FEM-10

**Office Hours:** Monday, 1:00-2:00, Tuesday, 10:00-12:00, Wednesday,1:00-2:00 (Canvas), Thursday, 12:00-1:00.

**Drop Deadline: January 24, 2020** – Last day to drop for full refund

**January 31, 2020 -** Last day to drop to avoid a “W” on transcript

**March 13, 2020 –** Final Drop Date (Letter grade assigned after)

**Final Exam:** TBD

**Text Book:** No text Book will be required, however, reference materials will be required and made available, and or, accessed by the student through online references.

**Course Prerequisite:** None

**Course Description:**

Preparation for employment and advancement within a State or Federal wildland fire agency. This course will convey what is currently understood about the role of wildfire in major ecosystem types. Analysis of plant and animal characteristics that appear to have coevolved with fire regimes and how human cultures have used and modified fire regimes, historically and currently.

SPRING 2020 ACEDEMIC CALENDAR



**Course Objectives:**

This course is designed provide students with the principles to evaluate the impacts of fire on vegetation, soils, and wildlife across different California bioregions and under a broad range of conditions. Students will become familiar with fire regimes, histories and ecology of major forest, rangeland and wetland ecosystems as they relate to natural and anthropogenic fire and fire suppression. This includes an understanding of:

* How fire interacts with abiotic and biotic components of ecosystems (i.e., plant communities, fuels, climate, topography, and soils) to affect forest and landscape structure and composition, both historically and currently.
* The role of fire as an ecosystem process.
* The use of fire in natural resource management, ecological restoration, and wildlife habitat enhancement.

This course focuses on the ecological aspects of fire science and how it relates to information that land managers, biologists, and policy makers are likely to require when making decisions associated with wildland fires.

**Learning Outcomes:**

In the process of completing this course students will:

1. Evaluate the impacts of fire, including pre- and post-fire conditions of sites, to predict potential short- and long-term outcomes of fire on ecosystems.

2. Describe fire regime relationships to various ecosystems and discuss the attributes for fire regime classification.

3. Gather data for fire history analysis.

4. Describe fire climate variables and how they affect fire return intervals and fire intensities.

5. Describe and explain fire regimes, histories and current fire dynamics associated with major forest, range and wetland ecosystems and predict first order fire effects.

**Cancelled Class Notification:** Communications for class cancellations will be made by your instructorthrough your preferred email account which will be collected the first day of class.

**Academic Dishonesty, Plagiarism and Cheating:**

Students at Reedley College are entitled to the best education that the college can make available to them, and they, their instructors, and their fellow students share the responsibility to ensure that this education is honestly obtained. Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college each student is expected to exert an entirely honest effort in all academic endeavors. Academic dishonesty in any form is a very serious offense and will incur serious consequences. Refer to the college catalog for further details surrounding actions that will be implemented regarding academic dishonesty.

Plagiarism is the adoption or reproduction of the ideas or words or statements of another person without due acknowledgment. Cheating is the act or attempted act of taking an examination or performing an assigned, evaluated task in a fraudulent or deceptive manner, such as having improper access to answers in an attempt to gain an unearned academic advantage. Cheating can take the form of the storing of information in graphing calculators, pagers, cell phones, and other electronic devices. Therefore, no items of any kind may be on the desktop, including water bottles, during testing. Students may not wear hats/caps during testing. Incidents of cheating and plagiarism may result in a variety of sanctions and penalties, which may range from a failing grade on a particular examination, paper, project, or assignment in question to a failing grade in the course at the discretion of the instructor and depending upon the severity and frequency of the incidents.

**Accommodations for students with disabilities**:

 If you have a verified need for an academic accommodation or materials in alternate media (e.g., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act please contact me as soon as possible. **A formal counseling assessment to determine the appropriate accommodation is required before any accommodation(s) can be made. The counseling center facilitates the process.**

**Field Trip**:

One field trip to Sierra National Forest burn site will be required. Students will be able to view, first hand, the effects of fire and fire exclusion in a forest ecosystem and compare their findings to an ecosystem where the historic fire regime has been reintroduced by successive fires. Presentations will be made by fire ecologists from the US Forest Service and/or other wildfire research institutions. A written paper will be required in lieu of field trip participation.

**Grading Policy**: Grading will be based on the results of two assignments/quizzes, field trip participation, midterm and final exams. Assignments must be submitted on the due date or earlier. **Assignments and exams will be based on lectures, in-class labs, and reading assignments. Please read all assigned readings!**

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| **Grade Distribution** |
| A = 270-300 Pts. | 90-100% |
| B = 240-269 Pts. | 80-89% |
| C = 210-239 Pts. | 70-79% |
| D = 180-209 Pts. | 60-69% |
| F = Below 180 Pts | Below 60% |

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| **Assignment Type** | **Possible Points** |
| Assignments/Quizes | 2 @ 25 Pts ea. = 50 |
| Mid-Term Exam | 75 |
| Final Exam | 100 |
| Field Trip Participation and or Paper | 75 |
| **TOTAL Points Possible** | **300** |

**Student Required PPE for Field Trips:**

*Each student must have the following items during each class in order to be allowed to participate and earn credit for field trip.*

- Hardhat

- Leather Gloves

- Water container (1-quart canteens or water bottles)

- Leather Boots (minimum 8” high uppers, nonskid soles preferably Vibram, no steel) (estimate $200)

- Long Pants w/ Belt (no cuffs, NO HOLES)

- Long Sleeve Cotton Work Shirt (NO HOLES)

- Backpack sufficient to carry hardhat, gloves, safety glasses, water, and food (needs to be in addition to your regular school backpack). Chest and waist straps are advisable.

\*\*\* Details will be given during the first class meeting\*\*\*

**Behavioral Standard Operating Procedures:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Respect and Common Courtesies:*** Students and teachers greatly appreciate attention to appropriate classroom courtesy. Please take care of personal needs (e.g., using the restroom, getting a drink, sharpening a pencil) before class begins. Foul language or disruption to the instruction will not be tolerated. All class attendees will treat and be treated with respect or will be asked to leave the class by the instructor. There will be no tobacco use in any building or school farm.

KEEP IT TIGHT: Seating arrangement must be in a close-knit cluster

***Attendance and Punctuality:***I start class on time and take roll. Please do not be late. If you are late, it is your responsibility to ensure that you are counted for attendance **after** class. To be considered present, students should be in class, attentive, properly attired, and ready for classroom or field activities regardless of weather or other factors. ***Two tardies will count as one absence.* *Roll will be taken at each session and students will be dropped if two absences are accrued unless specific arrangements are made.*** Field trips/exercises missed cannot be made up.

IF THERE IS ANYTHING I NEED TO KNOW: about your situation that may create challenges for you this semester you need to let me know as soon as possible, that way I can have awareness.

SLEEPING IN CLASS: If you are observed to be sleeping in class you will be excused until you can come back attentive. if you If you are tired while in class you may stand up at your discretion and

***Technological Gadgets:*** Please turn off or silence cell phones when entering the class.

PHONE USE WILL NOT BE ALLOWED IN CLASS: If you are observed using your phone during class time you will be asked to leave class, you will be marked as absent and will lose credit for the entire day. Phones will not be out while you are in the class room. All texting and electronic device activities must be done outside of class. You will get breaks on the hour, do what you need to do then outside of the class room. If you expect something to come up during class that requires phone use let me know and I will allow you to use/monitor it at my discretion.

***Assignments:***

WRITING ASSIGNMENTS: All writing assignments will require that you visit the Writing center in order to receive a full grade.

MODULE TAKE-AWAYS: After each class session you will be required to write down 5 main points that you took away from class.

YOU ARE REQUIRED TO TAKE NOTES, IT WILL BE A PART OF YOUR GRADE: Much of the concepts and information you will be required retain will be passed along through lectures. You must take good notes to ensure that you have the required material for study purposes. If you miss class you will need to find a class mate and obtain the notes for the day you missed. Lecture information will not always be formatted to be posted on canvas.

COMMUNICATION IS REQUIRED: Unless previously arranged with the instructor, if you miss a deadline on an assignment without contacting me ahead of time you will not get an opportunity to make it up, which means you will get a zero. You need to be a responsible adult; this program will not enable irresponsibility.

MISSED EXAM: In the event you are going to miss an exam OR assignment you must:

o Contact me at least 1 day ahead of time to let me know your special situation.

o Notify me ahead of time to not be penalized.

TEAM WORK: The only way we get through this is together. We need to help one another. Work as a team, pick each other up, help one another get through the academic and physical challenges, we need to have regular study groups, hold each other accountable and hold yourself accountable.

PERSONAL GROWTH AND EFFORT: You are here by choice and you are going to do it anyway, might as well do it right. Have some integrity to do the right thing when no is looking.

READING AND WRITING IS REQUIRED: During this course you should expect to have to communicate through reading, writing and oral briefings.

***Preparedness:***

YOU ARE RESPONSIBLE FOR YOUR LEARNING: If you don’t understand you need to ask. You are here by choice so, strive to do well. If you don’t ask, I cannot help you.

PARTICIPATION GUIDELINES: participation is considered active involvement in all class room or lab activities. Participation requires you to engage in lecture topics. You will be graded on your participation.

CLASS ROOM PREPAREDNESS: You will be docked preparedness/participation points for not having your required materials. You must always bring to class your Lecture/Lab Manuals

* YOU MUST ALWAYS BE PREPARED FOR CLASS:
	+ If you do not have your proper PPE you will be excused from class and will lose credit for the day.
	+ If you do not have your lab manual or notetaking materials you will be considered unprepared, will be excused from class and will lose credit for the day.
* Personal Protective Equipment (PPE) is mandatory for all field exercises. Safety rules must be strictly followed including the use of personal protective equipment (PPE) and cautious behavior. Students who fail to have in possession all PPE for field trip/exercises will not be allowed to participate, will be dismissed from the day’s exercise, and will be charged an absence for the day. ***SEE STUDENT REQUIRED PPE listed items at the end of this document.***
* ***Classroom Visitors:*** It is not acceptable to bring guests to class.
* ***Late Work:*** Work that is turned in late will lose 10% percentage grade points for each class session that is missed. (one class session late = -10% two class sessions late = -20%. Make up work ***will not*** be accepted after 3 missed sessions)
* ***Make-ups:*** Make up work will be accepted at the discretion of the instructor. All make up work must be discussed and approved by the instructor. Do not assume that make up work will be made available to you.
* ***Extra Credit:*** Extra Credit opportunities may be made available throughout the semester. Opportunities will be communicated as they arise.

Course Schedule:

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| **MODULE** | **TOPIC** | **SCHEDULE & ASSIGNMENTS** | **LEARNING OBJETIVES** |
| **1** | **Introduction** | * **LECTURE 1:** Course Intro-Ecology, fire ecology and the historical interaction of fire on the landscape.
* **PPT-** Intro to Fire Ecology
* **VIEW and DISCUSS**: YouTube-The Big Burn of 1910
 | * Define Fire Ecology
* Explore history of Fire in the western US. Gain an understanding of the various land management approaches from pre-human settlement, Native American and European settlement.
 |
| **2** | **Fire Behavior & Fuels/Load** | * **LECTURE 2a:** Fire Basics
* **LECTURE 2b:** Fire Behavior
* **PPT-**Fire as a Physical Process
* **VIEW and DISCUSS:** YouTube - Fire Behavior- Short Videos
 | * Identify components of the: 1) Fire Triangle and 2) Fire Behavior Triangle
* Understanding of topography and its effect on fire behavior.
* Understand how fire burns with different intensities given different fire component conditions.
 |
| **3** | **Fire as an Ecological Process** | * **LECTURE 3:** Fire as an Ecological Process
* **PPT-** Fire as an ecological process
* **VIEW and DISCUSS:** YouTube – Paul Hess-Why wildfires have gotten worse and what we can do about it.
* **IN CLASS GORUP ASSIGNMENT:** Answer study guide questions.
 | * Define a bioregion and understand the components that will affect fire interactions.
* Analyze Fuels and Fuel bed attributes related to fire behavior and severity.
* Define Fire Regimes and Fire return intervals.
 |
| **4** | **Field Study** | TBD PRESCRIBED BURN* **ASSIGNMENT:** Write a 1-page narrative to answer specified questions about field trip.
* **HOMEWORK:** Read Physical Environment Interactions
 | * Make connections of Learning Objectives to date.
 |
| **5** | **Fire and Physical Environment Interactions****QUIZ** | * **LECTURE:** Fire effects
* **PPT**- Fire and Physical Environment Interactions
* **VIEW and DISCUSS**: YouTube -
 | * Understand how fire intensities effect the quality of soils, water and air.
* Gain understanding of consumption of fuels.
* Assess fuel loading and structure
* Identify why aspect will have an effect on vegetation type
 |
| **6** | **Teakettle Experimental Forest** | * **LECTURE:** Restoration practices and assessments
* **VIEW and DISCUSS:** YouTube-Teakettle Experimental forest
* **IN CLASS GROUP ASSIGNMENT:** Answer study guide questions. ***Come up with 5 questions to ask in class.***
 | * Discuss concepts surrounding forests as an evolving organism
* Describe basic concepts of forest health and identify how fire plays a role in this.
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| **7** | **MID TERM REVIEW** | * **LECTURE:** Open Discussion and Review
 | * Reinforce concepts
 |
| **8** | **MID TERM** |  |  |
| **9** | **California Vegetation, Climate and Bioregions** | * **LECTURE:** Climate patterns, weather systems an ecological zone.
* **VIEW and DISCUSS:** Forest Under Fire Documentary
* **IN CLASS GROUP ASSIGNMENT:** California Bioregions breakdown and investigation
 | * Discuss Vegetation/Elevation zones.
* Discuss weather patterns and factors that affect fire behavior in an ecological zone.
* Gain an understanding of broad scale and local weather factors.
* Investigate bioregion components and understand the main factors that will affect how a fire will burn.
 |
| **10** | **Fire and Fuels Management** | * **LECTURE:** The evolution of Fire and Fuels Management
* **PPT-**Fire and Fuels Management
* **VIEW and DISCUSS:** YouTube: **#1**-Introcuction into wildland Fuels Management. **#2** 2014 San Juan Fire: Fuels treatment and Fire Management
* **ASSIGNEMNT-** Complete in class work sheet.
 | * Define fuels management and describe why it is needed.
* Describe types of fuels management techniques and their implications and complexities surrounding the activities.
* Identify the causal factors and evolution of the fuels emergency and history of fuels management.
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| **11** | **FIELD STUDY** | TBD PRESCRIBED BURN* **ASSIGNMENT:** Write a 1-page narrative to answer specified questions about field trip.

**HOMEWORK:** Read -Ponderosa Pine Migration | * Make connections of Learning Objectives to date.
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| **12** | **Fire Effects on Vegetation****QUIZ** | * **LECTURE:** Fire intensity effects on plants and their adaptions.
 | * Gain understanding of how fire can affect plant communities.
* Assess and understand how various plants are adapted to fire.
 |
| **13** | **Climate change, Wildfire and Species migration** | * **LECTURE:** The new fire season and species migration.
* **VIEW and DISCUSS:** YouTube- **#1** California Wildfires-the new normal, **#2** Paul Hess-Why wildfires have gotten worse and what we can do about it.
 | * Understand the change in Fire season intensity and length.
* Gain an understanding of species migration.
* Assess seed migration and relocation concepts
 |
| **14** | **Fire and At-Risk Species** | * **LECTURE:**
* **VIEW and DISCUSS:** YouTube- **#1** Pacific Fisher-Forgotten not Gone, **#2** Managing Forests and Wildlife.
* **IN CLASS GROUP ASSIGNMENT:** Answer Study Guide Questions
 | * Discuss the concepts of “species at risk” and varying levels of concern
* Assess how managing for species and forest restoration create complexities.
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| **15** | **FINAL REVIEW** | * **LECTURE:** Open Discussion and Review
 | * Reinforce concepts
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| **16** | **FINAL EXAM** |  |  |