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



**Course:** NR 45 – Section 51526

**Title:** Fuels Management

Tuesday – 8:00 to 9:30 p.m. LECTURE

Friday- 9:00 to 11:50 a.m. LAB

**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:**

This course provides preparation for employment and advancement within State and Federal wildland fire management agencies. This course will provide students with the knowledge of hazardous fuels mitigation to reduce the damaging effects of wildfires to natural resources and human improvements. Emphasis will be placed on prescribed burning, smoke management mitigations, coordination with silvicultural practices, and wildland-urban interface mitigations. Field trips may be required in this course and may require that lecture days be rolled into the lab day to add hours for the field trip. The instructor will give notice on these events.

SPRING 2020 ACEDEMIC CALENDAR



**Course Objectives:**

This course is designed provide students with the principles to evaluate the pre- suppression and forest health strategies in regards to fuels Management. Students will become familiar with various fuels management techniques and strategies, histories and progression of fuel management. This includes an understanding of:

* How fire moves on the landscape given plant communities, fuels, climate, topography, and soils.
* How fuels management practices affect forest and landscape structure and composition, both historically and currently.
* The planning process and challenges of fuels management.
* The use of fire in natural resource management, ecological restoration, and wildlife habitat enhancement.

This course focuses on the fuels management 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. Identify proper prescribe burn unit layout.

2. Monitor live and dead fuels moistures.

3. Calculate costs for a variety of fuels treatments.

4. Develop objectives for prescribed fires.

5. Prepare fire behavior predictions

6. Describe federal and state air quality regulations pertaining to the management of smoke produced by prescribed fires.

7. Review prescribed burn plans and Prescribed Fire Complexity Ratings.

8. Conduct dead and down fuels inventory surveys.

9. Gather fire weather observations for the preparation of spot weather forecasts.

**Class Notification:** Class notifications will be made by your instructor through **CANVAS.** you are ***required*** to monitor **CANVAS** for course updates, information sharing and assignments.

**Cancelled Class Notification:** Communications for class cancellations will be made by your instructorthrough **CANVAS.**

**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 | 25 |
| Quiz(s) | 25 |
| Mid-Term Exam | 80 |
| Final Exam | 100 |
| Field Trip Participation and or Paper | 70 |
| **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 3 lecture or 2 Lab absences are accrued unless specific arrangements are made. If the situation warrants the instructor may drop at their discretion.***  Field trips/exercises missed cannot be made up.

At the instructor’s discretion, any absences beyond 15 hours will be grounds to be dropped from the program. If you have other commitments that may impact your ability to show up on time or will impact your ability to attend class, you may want to enroll at another time.

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 in order to maintain focus. If your tiredness becomes a problem/distraction, the instructor may excuse you for the day and you may be marked absent.

***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 PARTICIPATION 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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| **SKILLS** | **REQUIRED SKILLS** | * **Browns Planer Transects**
* **Fuel Moisture Collection**
* **RAWS weather Station monitoring**
* **Spot Weather Forecast submission**
 | * **Land Navigation and map reading**
* **Avenza Mapping Systems**
* **BEHAVE Modeling system**
* **Fuel Stick measurements**
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| **MODULE** | **TOPIC** | **SCHEDULE & ASSIGNMENTS** | **LEARNING OBJETIVES** |
| **1** | **Introduction to Fuels Management & The Cohesive Strategy** | * **LECTURE 1a:** Fuels Management.
* **LECTURE 1b:** TheCohesive Strategy.
* **PPT-**
* **VIEW and DISCUSS**: \*\****YouTube***-
* **MOD-1: IN CLASS ASSIGNEMNT:** Case study work sheet
 | * Define Fuels Management
* Understand the principals of Suppression pre planning, fire probabilities and Risk.
* Gain an understanding of The National Cohesive strategy.
 |
| **2** | **Landscape assessment and Project Prioritization** | * **LECTURE 2:** Landscape assessment and priorities
* **PPT-**
* **VIEW and DISCUSS:** \*\****YouTube*** –
* **MOD-2: HOMEWORK-** Avenza Mapping system download
 | * Define Fuels management objectives.
* Gain an understanding of how fuels projects are prioritized by assessing Fire probabilities ecosystem restoration needs and landscape shapes.
* Define Fuels reduction activities and the pros and cons between various treatments.
* Introduction to Prescribed Fire and Mechanized Fuels treatments.

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| **3** |  **Forest Project Planning Process and Authorities**  | * **LECTURE 3a:** Project Initiation and Planning
* **LECTURE 3b:** NEPA & CEQA
* **PPT-**
* **VIEW and DISCUSS:** \*\****YouTube*** –
* **MOD-3: IN CLASS ASSIGNMENT:** Follow-along worksheet work sheet
 | * Introduction to the National Environmental Protection Act and California Environmental Quality Act.
* Define forest health actions as a whole system of treatments.
* Understand the required considerations of other forest resources during fuels management.
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| **4** | **FIELD STUDY****Blue Rush/Sierra National Forest-**  | * **ASSIGNMENT:** Assess Fuels reduction projects and impact on the landscape.
* **MOD-4: HOMEWORK:** Answer essay questions on assigned Field Study Worksheet
 | * Make connections of Learning Objectives to date.
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| **5** | **Fuels and Fuel Loading Assessments****QUIZ** | * **LECTURE 5:** Fuel loading and measurement systems
* **PPT**-
* **VIEW and DISCUSS**: ***YouTube*** –
* **Assignment:** Quiz
* ***MOD-5: HOMEWORK-*** Fuels Measurements Worksheet
 | * Define the various fuel types, fuels structure and their burning characteristics.
* Introduction to the 13 & 40 fuel models and Photo series fuels assessment tools.
* Brown’s Planer Transects and Fuels moisture collection.

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| **6** | **Fire Weather, Climate and Fuel Moisture** | * **LECTURE 6a:** Fire weather and climate*.*
* **LECTURE 6b***:* Fuel Moisture
* **LECTURE 6c:** Fire behavior modeling
* **PPT-**
* **VIEW and DISCUSS:**

***- YouTube:*** * **MOD-6: IN CLASS GROUP ASSIGNMENT:**
 | * Introduction to the Remote Automated Weather Systems and fire weather.
* Describe how weather, Seasonality and climate affect fuel moisture and fire behavior potential.
* Evaluate Fuel stick measurements
* Introduction to BEHAVE fire behavior modeling system.
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| **7** | **FUELS PROJECT DESIGN** | * **IN CLASS ASSIGNEMENT:** Walk through process for designing and Fuels management plan
 | * Make connection of learning objectives to date
* Apply planning concepts to a fuels reduction project.
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| **8** | **MID TERM** |  |  |
| **9** | **FIELD STUDY****Dinkey Collaborative Restoration** | * **MOD-9: ASSIGNMENT:** Field Study Worksheet
 | * Make connection of learning objectives to date
 |
| **10** | **Prescribed Fire** | * **LECTURE 10:** Prescribe fire applications
* **PPT-**
* **VIEW and DISCUSS:** ***YouTube:*** **ASSIGNEMNT-**
 | * Define how prescribed fire is used and its limitations
* Describe the effective application of a prescribed fire.
* Evaluate the purpose and use of a prescribed fire burn plan.
* Understanding of Prescribed Fire objectives and consumption.
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| **11** | **Prescribed Fire Burn Plan Elements** | * **LECTURE 11:** Burn Plan Elements
* **ASSIGNMENT:** Wildland fire scenario
* **MOD-11: HOMEWORK:**
 | * Gain an understanding of Prescribed fire burn plan elements.
* Introduction to the Prescribed Fire Implementation Guide
 |
| **12** | **Strategically Placed Landscape Treatments**  | * **LECTURE 12:** Strategic Landscape Treatments
* **VIEW and DISCUSS:**

**- YouTube- #1** Esperanza Fire | * Gain understanding of fuel break design and use.
* Evaluate the patchwork approach to landscape treatments.
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| **13** | **Social Considerations*****Guest Instructor*** | * **LECTURE 13a:** Qualifications and Promotion
* **VIEW and DISCUSS:**
 | * Identify Social Challenges for Fuel Management Projects.
* Explore possible avenues for Fuels management awareness and the public.
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| **14** | **Fuels Management Careers** | * **LECTURE 14:** Qualifications and Promotion
* **HOMEWORK:** Answer Study Guide Questions
 | * Understand the promotional process in the wildland fire service.
* Understand the training pathway for qualifications and advancement.
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| **15** | **FINAL REVIEW** | * **LECTURE:** Open Discussion and Review
 | * Reinforce concepts
 |
| **16** | **FINAL EXAM** |  |  |