INTRODUCTION TO FIRE MANAGEMENT
FORESTRY 337.001

Instructor: Dr. Brian Oswald
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Office: FOR 201B
Office Hours: M,T,W,R: 10:00-11:00; M,R: 1:00-2:00.
In addition, open door policy and by appointment.
Department: Arthur Temple College of Forestry and Agriculture
Class Meeting time and place: M,W: 9:00-9:50, Room 205 Forestry Building

Course Description: Explore fire history in the U.S., fire occurrence, effects and behavior, detection and control. The integration of fire in land management planning and policy will also be stressed. Prerequisite: FOR 209 or permission of instructor.

Program Learning Outcomes (PLO’s):

Forestry 337 is one of the forestry core courses required of all forestry majors and thus competency is required. A minimum grade of a “C” must be attained or the course will have to be repeated. The following course learning outcomes (PLO’s) have been approved for the Bachelor of Science in Forestry (BSF) degree program:

1. Demonstrate understanding and competency of forest ecology and biology (PLO1);
2. Demonstrate understanding and competency in the measurement of forest resources (PLO2);
3. Demonstrate understanding and competency in managing forest resources (PLO3);
4. Demonstrate understanding and competency of forest resource policy, economics, and administration (PLO4);
5. Demonstrate understanding and competency in oral and written communication skills (PLO5).

Student Learning Outcomes:
1: Demonstrate knowledge of the importance of fire as a factor in forest and range environments (I, PLO 1).
2: Demonstrate understanding of the basic principles of combustion of forest and range fuels, (I, PLO1).
3: Demonstrate knowledge of fire behavior and fire ecology under various conditions (I, PLO1).
4: Demonstrate the ability to identify current problems/trends in fire management prevention, detection and suppression (A, PLO4).
5: Demonstrate the ability to describe the use of fire in land management (A, PLO3)
6: Demonstrate the ability to critically think about Wildland fire issues as well as communicate in both written and oral forms (I, PLO5).

A: Advanced – FOR 337 supports Program Learning Outcome by providing students with transitional, high level topic-specific information, activities, and
opportunities that enable the students to apply their critical thinking and tactical skills to resolved increasingly challenging strategic situations.

I – Intermediate – course supports Program Learning Outcome by providing students with topic-specific information, concepts, applications, and lab activities that increase the students’ skills in making tactical implementation decisions relative to the expected outcomes.


Course Requirements:
- 4, 100 point semester exams
- 1, 100 point optional term paper to replace worse test grade

Tentative Course Calendar: This is a general outline of lecture materials and topics. Dates/topics are subject to change. This schedule is tentative and I reserve the right to adjust the schedule as needed. You will be kept aware of any changes – but this schedule below will serve as a starting point for lectures this semester.

Week 1: Introduction – where does fire fit into the environment.
Weeks 2-3: The combustion process and behavior.
Test 1
Week 4: Wildland fuels.
Week 5: Fire weather.
Test 2
Weeks 6-11: Fire Ecology
Test 3
Weeks 12-15: Fire Culture and Fire management.
Test 3

Grading Policy:
Each semester exam is worth 25% of final grade, and the optional term paper worth 25% of the final grade, replacing the worse test grade. The term paper topic can be on any aspect of fire ecology/management. If the class average for the first three exam is 80% or higher, the material covered in that test will not be on the last exam. Make up exams must be completed within 1 week of excused absence of the test. Participation and attitude will be used on borderline cases. I will make every effort to return assignments within 1 week of the due date. Because I do travel as part of my faculty responsibilities, I may not be able to reach these goals. Since the weight of each assignment is listed, a student should be able to determine their own performance in the class. Do not expect me to do this for you!
Cell Phones:
Let’s make it easy - turn them off. If you are an EMT or in a Volunteer Fire Department, you must let me know. Since we know that the clocks in the classrooms are all over the place, I will have my cell phone on silent and I will check the time if needed-no reason for you to do so. If you have the cell phone on and look at it during a test, I will assume you are cheating. If you look at your cell phone during class, I will assume you are not interested in the class material and will ask you to leave.

Attendance Policy:
Class attendance is expected except for valid excuses. Being late regularly is not acceptable and will result in loss of points. It is distracting to me and the other students for you to leave class to use the restroom, so please address that issue prior to class.

Academic Integrity (A-9.1)
Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit. Please read the complete policy at [http://www.sfasu.edu/policies/academic_integrity.asp](http://www.sfasu.edu/policies/academic_integrity.asp).

Cheating or plagiarism may result in a least a “zero” on the assignment in question, and possibly an “F” for the course. Students are urges to make sure they do their own work, make sure the papers they write are cited correctly, and most importantly, are in their own words! SFA Policy A-9.1 defines what constitutes cheating and plagiarism. While the policy does appear to allow for the cutting and pasting of information from a published source as long as proper credit is given, those actions will not be allowed. Submission of a paper written for another class may show up as a plagiarized paper- do this at your own risk.

Acceptable Student Behavior
Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is
appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

**Withheld Grades Semester Grades Policy (A-54)**

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

**Students with Disabilities**

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](http://www.sfasu.edu/disabilityservices/).

**Guidelines for optional term papers:**

To repeat: SFA Policy A-9.1 defines what constitutes cheating and plagiarism. While the policy does allow for the cutting and pasting of information from a published source as long as proper credit is given, those actions will not be allowed for the term paper in this class. Each term paper must be written so that the words are those of the student. Cutting and pasting of sections of a paper, even when giving in-text citation for the source of the information and quotations will not be accepted. The policy does not supersede this requirement of the paper for this class.

1: **Length:** Text (excluding Literature Cited, Cover sheet, Figures, Tables, etc.) should be 5-8 typed-written 1.5 or 2 line spacing. Longer papers may be needed to cover the species, but will not earn you more credit automatically. If you come up with less than 6 pages, see me **BEFORE** you turn it in. They can be turned in anytime prior to the due date. You may give me a draft of your paper anytime 5 days prior to the due date. I will then look it over and give you a tentative grade based on what you have written and I will suggest what could be done to improve the paper.

2: Any topic in fire management is acceptable, as long as I think there is enough material available to write a paper on it. If in doubt, see me. No duplication of topics is allowed, so it is a first come-first served choice, beginning on the first day of class. **Topics must be identified by February 26, 2020. Failure to do this will cost you 5% off the top of your term paper grade. The term paper will be due by April 1, 2020 at the beginning of the class period.** No late papers will be accepted. Each student must
send me an electronic copy of the paper on or before the due date, as well as turning in a hard copy.

3: Proper in-text citation must be used. This means (author, year), **not** (author, page #). Use these same journals for proper citation method for the Literature Cited section (not works cited, references, bibliography—use of these headings will cost you points). See me if you have questions about style. The number of citations required to do a good job on these papers will vary with the species. If in doubt, ask. A minimum of 6 should get you going. If you write 6-8 pages based on 6 citations, don’t expect an “A”. Six will get you going, but not meet the requirements for an “A” paper in a junior level class.

5: Please watch the use of websites for information. Many sites are not refereed (meaning not having been reviewed by other scientists), and the information presented may be flat out wrong. There is a difference between going to the SFA Library webpage, accessing the database section and under forestry clicking on AGRICOLA, vs. Joe Bubba John’s fire webpage. Go with the first, ignore the last.

6: The attached copy of the guideline for authors for the journal “Rangeland Ecology and Management” must be used for all technical aspects of the paper. You do not need to have the same sections as they describe since you are writing a term paper, not a research paper.

**Grading Information for Term Papers/Take Home Tests for Dr. Oswald**

The following will assist every student by providing them with the penalties that will be applied if they fail to include the specific item. Correct inclusion of all of these items does not however guarantee the student an A.

1: Proper cover sheet (10 pts). This should follow the general information required in most Forestry courses, including, but not limited to: title, author, course, instructor name, date and the phrasing the begins “in partial completion of the requirements for FOR XXX....”

2: Title on top of first page of text (5 pts).

3: The use of headings and subheadings for term papers (10 pts). These should be used to help organize the paper. Make an outline, use the outline as your headings, and your paper will be well organized. This will also allow the student to develop proper paragraphs.

4: The list of literature and websites used in the paper will be called “Literature Cited”. Any other term that is used will cost you (10 pts).

5: In text citation (up to 15 pts). That means last name of author(s) and year in the text (Smith 2009), not the literature cited section of paper. Two authors? Give both names in text (Smith and Jones 2009 or Smith & Jones 2009). More than 2? Use et al. (in italics)
or the phrase “and others” after first author name (Smith et al., 2009 or Smith and others 2009).

6: Failure to provide the proper length required for the paper. (up to 15 pts).

7: Failure to provide citations (no cutting and pasting) for information that is not common knowledge (up to 25 pts).

8: Failure to provide electronic copy of paper/take home test within required time (15 pts).

9: The first time you provide the common name for any species of animal or plant, you must provide the scientific name (in italics) as well right after each common name. (10 pts).

10: Only 3 on-line citations (non-referred source) may be used; an electronic version of a hard copy publication is allowed. On-line version of refereed publications do not count towards the maximum of three. Any more - 5 pts for each.

11: No quotes. 10 pts off if you do.

12: Page numbers are required (excluding title page). 5 pts.

13: In literature cited section, the order should be alphabetical by author(s), year. Title, source. Pages. Write out all author names-do not use et al. 15 points maximum.

14: In text, spp. or sp. are not in italics. et al. is. 5 pts.

15: Papers do not discuss, nor do they present. Don’t put in such lines in your introduction. 5 pts off.
Fire as Chemical and Physical Event
Regulated Fires
Free-burning Fires
Fire
Combustion
Fuel
Cellulose
Hemi-cellulose
Lignin
Extractives
Phases of Combustion
Pre-ignition
Pre-heating
Dehydration
Pyrolysis
Moisture of Extinction
Thermal Conductivity/Diffusivity
Surface/Volume Ratio
Combustion
Ignition
Extinction
Heat Transfer
Convection
Conduction
Radiation
Flaming Combustion
Flame Height
Flame Length
Flame Depth
Fireline Intensity
Rate of Spread
Glowing Combustion
Head Fires
Back Fires
Flank Fires
Products of Wildland Fires-Burning, not ecological effects

FIRE BEHAVIOR
Chapter 2 in Text

Fire Growth
Intensity and Growth
Self-sustaining fires
Large fires/Fire Complexes
Rate of Spread
Intensity
Fireline Intensity
Fire Intensity
Fire Shape and Growth
Ground Fires
Surface Fires
Crown/Canopy Fires
Rate of Spread Factors
  Fuels
  Wind
  Topography
Modes of Propagation
  Head
  Convection
  Crown Fire-Torching
  Spotting
  Fire Whirls
Erratic Fire Behavior
  Spotting
  Ignition Sources
  Torching
  Effective Wind Speed
  Flame Reach
Crown Fire Factors
Fire Vortices/Fire Whirls

FUELS
Chapter 3 in Text

Fuel Moisture
  Live Fuels
  Dead Fuels
Fuel Models
Appraising Fuels
Fuel Loading
Moisture Content
Fuel Models
Fuel Complexes
SECTION 2 Weather and Ecology
FIRE WEATHER
Chapter 4 in Text

Atmospheric Stability
Indicators of Stability/Instability
Inversion Layers
Haines Index
Atmospheric Stability effects on Fire Behavior
Moisture
Wind
Fire Danger Rating
Burn Period
Critical Fire Periods
Fire Season
Fire Climates

FIRE ECOLOGY
Chapter 5 in Text

Species survival after fire
Adaptability
Survival
General Effects on Soil
Physical Changes, texture, water repellency
Chemical Changes
Ph
Nitrogen
Sulfur
Phosphorus
Potassium
CEC
Calcium/Magnesium
Microorganisms
General Effects on Watersheds, Water
Interception
Infiltration
Runoff
Soil Movement
Water Quantity and Quality
General Effects on Air
Smoke Management
General Effects on Vegetation
Direct vs. Indirect
Growth stimulation/stress
Foliar damage-scorch
Grass/Shrubs
Bark vs. Cambium
Specific Communities
Grasslands
  Shortgrass
  Mixed-grass
  Tallgrass
Semi-desert shrub-grasslands
Chaparral
Sagebrush
Pinyon-Juniper
Western Conifers
Southeast Forests
Northeast/Northern Forests

SECTION 3  FIRE, HUMANS, and MANAGEMENT

Fire and Humans
Chapter 6 in Text

Fire Regime
Fire History
  How to measure
Fire Cycle
Mean Fire Interval
Fire and Native Americans
Fire and European Settlement
Major Fires (see handouts)
Fire and Regulations/Laws
  Timber Culture Act
  Transfer Act
  Clark-McNary Act
History of Fire Attitudes
  Frontier Fire
  Backcountry Fire
  Mass Fire
  Wilderness Fire
  Today?
Commonalities of Large Fires
  Weather
  Fuels
  Timing
  Cause
FIRE MANAGEMENT
Chapters 7, 8 and 9 in Text

Objectives of Fire Management
Considerations/Perspectives when looking at Fire Management in US
   Historical
   Political
   Administration
   Economic
Fire Management Structure
   Federal
   State
   Private Sector
   International

Fire Prevention
   Education
   Engineering
   Enforcement
   Weather Modification
Problem Fires
Detection and Communication
Fuels Management
   Reduction
   Conversion
   Fuel Isolation

Fire Suppression
   Wildfire
   Escaped Fire
   Prescribed Fire
Control
   Direct
   Perimeter
   Prescription
Fire Fighting Orders