

# NRES 497/697: Forest and Range Soils, Spring 2016

**Time:** Tuesday/Thursdays 9:30 to 10:20, Friday Lab 12-3

**Room:** Lecture: KRC 104; Lab: AE 004 and others

**Instructor:** Dr. Benjamin (Ben) Sullivan

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Email: bsullivan@cabnr.unr.edu

Office location: In the back of FA 132. Knock hard if door is shut!

Office hours: Tuesdays 1-2; Fridays 10:30-11:30; *OR by appointment*

**Website:** Please use the course website on WebCampus to download handouts, assignments, and homework files. I will do my best to provide powerpoint or pdf files of my in-class lecture slides after class to improve note-taking. This is not a reason to skip class, and I provide them as a courtesy, not a guarantee. I will use MyNevada for e-mail announcements.

**Course description:** Forest and range soil characterization, physical properties, and biogeochemistry as affected by management, pollutants, and disturbances. Field trips required.

**Prerequisite:** NRES 322: Soils *OR* consent of instructor. Recommended Preparation: [CHEM 122A](#) ; [CHEM 122L](#)

**Text:** The required text for this course is *Ecology and Management of Forest Soils* by Daniel Binkley and Richard Fischer. The 4<sup>th</sup> edition is the most recent, and contains substantial changes from previous editions. While this strong text applies to forest soils, many concepts are similar in range soils.

An enjoyable, but not required, book on the subject is *Dirt: The Erosion of Civilizations* by D.R. Montgomery.

*Additional Reading will be supplied via handouts/WebCampus.*

## **Additional information:**

**Field trips:** There will be two full-day field labs during the semester: Saturday March 12<sup>th</sup> and Saturday April 16<sup>th</sup>. Attendance for these field trips is mandatory; make-ups will not be available.

**Meeting for labs/field trips:** Please stay tuned for in-class/email announcements about meeting locations on the day of labs. Given the class enrollment, these field trips may require some specific arrangements.

## **Student learning objectives:**

Students will be able to communicate, in writing or verbally, an understanding of important forest and range soil properties and processes relating to the biology, physics, and chemistry of soils.

Students will be able to identify and characterize forest and range soils in the field.

Students will be demonstrate, in writing, an understanding of plant-soil feedbacks, aboveground and belowground interactions, and the relationship between forest and range management and soils.

Students will be able to communicate, in writing or verbally, the ways that disturbances, including human-induced global change, impact forest and range soils as a natural resource.

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**Graded assignments & grading system:** Student learning will be evaluated using graded activities divided into the following categories:

**Exams:** There will be two midterm exams and one final exam. Each exam will be worth 50 points; the final will be worth 100 points and will be cumulative. Exams will consist of multiple choice, short answer, and essay questions. Calculators will be allowed; cell phone calculators are strictly forbidden.

**Case studies:** There will be three “case study” assignments – an opportunity to critically evaluate and assess peer-reviewed manuscripts relevant to the in-class material. A case study assignment will consist of reading a published, peer-reviewed manuscript and addressing 2-4 related short-answer-style questions. Each case study will be worth 25 points. The first week of class, during lab period, we will have an exercise in evaluating peer-reviewed literature to prepare all students for case study assignments.

**Final lab report:** The final lab field trip to the Mountain Meadows in Westwood, CA will be different than the other labs. Groups of ~4 students will work together to ask and answer a question based on our field trip. This group project analysis will be presented to the class during the final lab period of class on April 29<sup>th</sup> in a 10-minute PowerPoint-format talk, and will include a 5-page written report describing the question, rationale, methods, results, and discussion of the lab field trip. The presentations will be worth 25 points; the lab report will be worth 50 points.

**Exam Q/A's:** Before each exam, every student must send me two exam questions AND their answers. Q/A's MUST be submitted to me by email in MS Word, .txt, or .rtf form. *I will not accept PDFs.* I will compile these Q/A's into a review document and share with the class after its due date. Each set of exam Q/A's will be worth 10 points.

Letter grades will be assigned as follows, based upon the average percent grade for homework, midterm, term paper (for 697 students, due the day of the final exam) and final:

<u>Grade</u>	<u>Semester Average (%)</u>
A+	97-100
A	92-96
A-	88-91
B+	84-87
B	79-84
B-	75-78
C+	72-74
C	68-71
C-	64-67
D+	60-63
D	56-59
D-	51-55
F	<50

Late assignments will points deducted at the rate of 10% per day the assignment was late. There will be no retests. Missed exams, assignments, or, presentations will receive 0 points. Makeup tests and assignments will only be administered when the student provides an official,

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documented medical excuse or when the student has notified the instructor, in writing, of exceptional circumstances that are mutually acceptable personal and/or professional reasons. This latter statement is provided as a courtesy to the students and should not be abused, but rather used in truly exceptional circumstances. Makeup assignments may deviate from the original exercise.

### **NRES 697**

The goal of NRES 697 is to provide graduate students to opportunity to achieve deeper understanding of the material presented to the combined group by allowing them to synthesize the ideas presented in class with their own research interests.

Graduate students will be assigned one extra assignment: a proposal to address an unknown or poorly understood aspect of forest and range soil science as it pertains to the students' own research. To complete the project assignment, 697 students will be required to meet with Dr. Sullivan by mid-semester to discuss proposal ideas and interests. Two weeks after meeting, they will be required to submit an outline with ten relevant references. This assignment will be evaluated (50 points) to ensure the proposal development is on track. The final proposal will be worth 100 points.

Additionally, graduate students enrolled in 697 will be required to take a leadership role during group lab exercises. This does not mean that the 497 students are absolved of responsibility for their contributions to the project, but rather that the 697 students will be expected to provide organization, a minor degree of student mentoring, and some technical knowledge (scientific writing, basic statistics) to the group.

The graduate students will be evaluated based on the same assignments as the 497 students, plus their final report. Graduate students will also be evaluated by the 497 students and their peers regarding leadership of the group project.

### **POLICIES AND STATEMENTS**

#### **Policy on Absence**

I adhere to the new UNR policy on student absences:

There are no official absences from any university class. It is the personal responsibility of the student to consult with the professor regarding absence from class. In the event that a student misses a class because of an official university function or event or because of serious personal considerations, the Office of the Associate Vice President for Student Life Services may, at its discretion, send an explanation to the instructor involved or to the faculty in general. The instructor shall make the final determination on whether the missed work can be done at a time other than during the regularly scheduled class period.

In short, your attendance is your business, but attendance will be directly linked to success in the course. Consult with me on absences. Absences from exams or assignments will be treated as described in "Graded assignments & grading system." If you miss graded events, and I have no advance knowledge,

#### **Academic Dishonesty**

Academic dishonesty of any form is a serious offense: It is a waste of my time and yours. The UNR statement on academic dishonesty is as follows:

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Cheating, plagiarism or otherwise obtaining grades under false pretenses constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student's enrollment without a grade, giving an F for the course or for the assignment.

For more details, see the [University of Nevada, Reno General Catalog](#).

In this course, there will be opportunities in labs and classroom to work in groups. However, each student must turn in their own individual assignment, and copied language or ideas among students will be considered plagiarism and treated accordingly.

### **Disability Services**

Any student with a disability needing academic adjustments or accommodations is requested to speak with me or the Disability Resource Center (Thompson Building, Suite 101) as soon as possible to arrange for appropriate accommodations.

### **Academic Success Services**

There's nothing I would like more than to see you succeed in the course. Please use appropriate resources to ensure this result. Discuss concerns, ideas, or suggestions with me. Your student fees cover usage of the Math Center (784-4433 or [www.unr.edu/mathcenter/](http://www.unr.edu/mathcenter/)), Tutoring Center (784-6801 or [www.unr.edu/tutoring-center](http://www.unr.edu/tutoring-center)), and University Writing Center (784-6030 or <http://www.unr.edu/writing-center>). These centers support your classroom learning; it is your responsibility to take advantage of their services. Keep in mind that seeking help outside of class is the sign of a responsible and successful student.

### **Audio and Video Recording**

I adhere to the UNR policy on audio and video recording:

Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may be given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.

### **Important dates:**

February 9<sup>th</sup>: Case Study 1 due

February 12<sup>th</sup>: Exam 1 Q & As due

February 18<sup>th</sup>: Exam 1

March 8<sup>th</sup>: Case study 2 due

March 11<sup>th</sup>: Exam 2 Q & As due

March 12<sup>th</sup>: Soil classification field trip: all day Saturday

March 15<sup>th</sup>: 697 Students should have met with me

March 17<sup>th</sup>: Exam 2

March 29<sup>th</sup>: Final day to drop classes and receive a "W"

April 5<sup>th</sup>: Case Study 3 due; 697 students submit their outline and 10 references of final paper

April 16<sup>th</sup>: Mountain Meadows field trip: all day Saturday

April 29<sup>th</sup>: Lab presentations due

May 10<sup>th</sup>: Final exam, 12:30-2:30

### **Course calendar below:**

	Week	Dates	Topics	Reading	Lab/Field Trip
<b>Part 1: Properties of Forest and Range Soils</b>	1	1/19-1/22	Introduction to forest and range soil, plant soil feedbacks	Ch. 1, 2	In-class case-study discussion
	2	1/26-1/29	Physical properties of forest and range soil	Handout, Ch. 5	Soil Texture, infiltration, calculations
	3	2/2-2/5	Soil Biology: organic matter, roots, microbes, and soil fauna	Ch. 4, 6	Case Study 1
	4	2/9-2/12	Nutrition of forest and range soils: the spice of life	Handout, Ch. 7	Respiration, mass loss, roots, and nutrients
	5	2/16-2/19	Review, Exam 1		No lab
<b>Part 2: Classification of Forest and Range Soils</b>	6	2/23-2/26	Distribution/characteristics of forest and range soils, pedogenesis in arid environments	Ch. 2, Handout	Web Soil Survey Based Lab
	7	3/1-3/4	Horizons, Series, and soil naming conventions	Handout	Case Study 2
	8	3/8-3/11	Soil sampling: techniques, design, and challenges	Ch. 9	
		3/12	<b>Field Trip: Survey of Northern Nevada Soils</b>		<b>Required Saturday Field Trip: Classifying range soils of Northern Nevada</b>
<b>Part 3: Disturbance and Management in Forest and Range Soils</b>	9	3/15-3/18	Grazing, Exam 2		No lab
	10	3/22-3/25	Spring Break, Enjoy!		No lab
	11	3/29-4/1	Effects of fire on forest and range soil	Ch. 13, Handout	Case Study 3
	12	4/5-4/8	Invasive species and soil impacts	Ch. 11	Main Station Farm; methods
	13	4/12-4/15	Managing for production; harvesting	Ch. 12	
		4/16	<b>Field Trip: Mountain meadows and adjacent forested land: simultaneous management for timber, beef, water, and carbon</b>		<b>Required Saturday Field Trip: Meadows, Westwood, CA</b>
	14	4/19-4/23	Soils after disturbance and impacts on global element cycles	Ch. 15	Data analysis from meadows field trip
	15	4/26-4/29	Soils of tomorrow: restoration, effects of altered atmosphere, and land-use legacy	Handout	Presentations on meadows field trip results
	16	5/3+Finals Week	Review and synthesis, evaluations, Final Exam May 10 12:30		