

# Grazing Ecology and Management

RA M 436A/536A

Spring 2007

2 U, MW 9:00-9:50, 333 Education

<http://ag.arizona.edu/classes/ram436>

## Useful quick links:

- [Organization of the course](#)
- [Exercises, exams, etc.](#)
- [Schedule](#)

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**Instructor:** Steve Smith, 211 BSE, [azalfalf@ag.arizona.edu](mailto:azalfalf@ag.arizona.edu), 621-5325; [web page](#). Office hours are by appointment.

## **Course description:**

This course examines how herbivores interact with their environment and how to apply this knowledge to manage grazing animals and their habitat. Emphasis is placed on the scientific basis for grazing management decisions and management designed to accomplish a variety of outcomes.

## **Desired Student Outcomes:**

Students completing this course are expected to acquire:

- Basic knowledge of the ecological principles that underlie the interactions between grazing animals and the environment they inhabit. This includes the relevant elements of history, geography, evolution, geochemistry, hydrology, climatology, and plant development and physiology, and animal anatomy, physiology, and behavior;
- An understanding of methods and procedures used in grazing ecology and management research and practice including the scientific vocabulary of this field;
- The ability to able to apply fundamental principles to develop integrated solutions to a variety of grazing management problems;
- The ability to understand and critically interpret scientific and popular presentations dealing with grazing ecology and management;
- The ability to think critically as demonstrated by evaluating information from multiple perspectives, draw reasonable conclusions, and defend them rationally;
- The ability to clearly communicate scientific concepts and analytical arguments related to grazing ecology and management to both general and scientific audiences.

## **Organization and conduct of the course:**

We will learn about grazing ecology and management using a variety of approaches. These will include:

1. “Traditional” **lectures**. Most lectures will involve a PowerPoint presentation. Some, but not all of these presentations will be available for downloading for a limited time—usually for the seven days after they are presented. See the Schedule on the web page to identify these presentations. At least some lectures will be “interactive” with active participation by everyone and not just the instructor. Participation will be part of a student’s final grade in the course. In some cases, scoring participation will involve an evaluation of the quality of participation, in others it will be based simply on whether a student does or does not participate. If you are prepared, organized and engaged in lecture you will likely earn good participation scores. **Group discussions**. In these instances a topic or question is presented to the class and is discussed in detail at a following meeting. Preparation for these discussions may involve reading the text, reviewing material from previous lectures/discussions or other independent study. Graded exercises may be incorporated into group discussions. **Group discussions are highlighted in green text in the Schedule.**
2. **Electronic tutorials**. These will typically involve self-paced study of a downloaded text and image presentations—generally as PowerPoint files. (See Resources section below for information on viewing PowerPoint files.) The tutorials should be completed in a specific period of time, which is noted on the Schedule. Some tutorials may be available on-line for a limited time. In some cases, tutorials may replace a regular classroom meeting.
3. **Group review session**. Helping other students learn may be one of the best ways to learn material. In the final week of classes, all undergraduates will organize and execute a group review session(s) for their classmates. Students will organize the session(s) with assistance from the instructor. The format will directly reflect student’s needs. Each student’s participation in the session will be evaluated.

## **Resources:**

The key resource for this class is the course [home page](#). All links will be available on this page. Content of the page will change periodically.

**Passwords** -- For copyrighted (and other) materials that you access via the class web site the username is  and the password is  (both lowercase).

Viewing pdf files will require the most recent version of the free [Adobe Reader](#) installed on the computer you are using. If the computer that you are using does not have PowerPoint installed, you may download a free [PowerPoint viewer](#) (PC version only), which will allow you to view PowerPoint presentations.

## **Evaluation:**

All grading is done separately for undergraduate and graduate students. Graduate students will be required to meet separately with me twice during the semester. Graduate students will read current literature and discuss these readings during these special meetings. Assignment of final grades is not based on any preconceived thresholds for letter grades, but roughly follows: >90% = A; 80-89% = B; 70-79% = C; 60-69% = D; <60% = E.

Midterm exams (two, only highest single score counts, no make-ups given)	1 @ 100 points = 100
Lecture/electronic tutorial exercises	6 @ 10 points = 60
Stocking rate calculator	1 @ 40 points = 40
Participation (includes Group Discussion participation)	45 points = 45
Group Review for Final Exam <sup>1</sup>	1 @ 25 points = 25
<a href="#">Discussion of current literature</a> <sup>2</sup>	1 @ 25 points = 25
Final exam (comprehensive)	1 @ 150 points = 150
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<b>TOTAL</b>	<b>420 pts.</b>

<sup>1</sup> Undergraduate students only.

<sup>2</sup> Graduate students only.

### **Late work:**

Late work will be accepted only in rare circumstances. As soon as you realize that you will be unable to turn in work on time, contact me immediately and explain your situation. I will determine whether late work will be accepted and will inform you of the revised due date and any penalties that will be applied to your grade for the work.

### **Staying in contact:**

Ask me for clarification whenever you need it (with one exception, noted below) – in class, during office hours, or by email. Students are sometimes reluctant to ask for help because they think it's an imposition on the instructor. This is nonsense. The main reason why instructors are here is to answer your questions! The other reason students are reluctant to ask for help, especially in class, is that they sometimes think they're "the only one who doesn't get it." This is rarely true, so ask away. The exception mentioned above is this: I will not be available to answer your questions in the 24 hours before an exam. You'll really have to plan ahead to get help around exams.

***E-mail -- Feel free to contact me via e-mail if you have a question or if you would like to schedule a face-to-face meeting.***

You may be required to submit some assignments electronically as part of this course. Text should be submitted only in the body of your e-mail message. ***No attachments will be accepted!***

### **Absences and classroom conduct:**

You are expected to attend all lectures and discussions. If an absence is anticipated, you must inform the instructor of the time and reason for the absence. Special arrangements to present information missed while absent may be made by the instructor only under these circumstances. While in class you are expected to conduct yourself in a manner conducive to learning and in a way that does not interfere with other students' concentration.

### **Special needs and accommodations:**

If you need special accommodations or services contact the Learning Disabilities Program/S.A.L.T., Old Main 117 (621-1242) or the Center for Disability Related Resources, 2nd and Cherry (621-5227). I will do everything I can to accommodate your needs in order to enhance your learning experience, but I must know beforehand.

### **Academic integrity:**

You are encouraged to share intellectual views and discuss freely the principles and applications of the course materials. However, graded classroom, laboratory and homework exercises must be executed independently, except as specifically noted by the instructor. This course operates under the Code of Academic Integrity as described at <http://catalog.arizona.edu/policies/974/acacode.htm>

It is unacceptable in this course to submit work without complete citation describing its source(s). For example, it is considered a violation of the Code of Academic Integrity to use work that was previously generated in another course (by you or someone else) to meet an assignment in this course without clearly acknowledgment of this fact as part of the assignment.

As a student it is your responsibility to be completely familiar with and adhere to the rules for academic behavior discussed in the Code of Academic Integrity. If you have any questions whatsoever, ask one of your instructors before you act. The consequences of not doing so may be extreme.

### **Incomplete Policy:**

Any incomplete grade given must be verified with a written agreement with the student that specifies the work to be done and a timetable for completion. Incomplete grades are assigned only in extreme circumstances when it is impossible for the student to complete a minor portion of the work required for a course. These grades are not to be used as a mechanism to retake a course because of generally poor performance. For more information see: <http://www.registrar.arizona.edu/gradepolicy/incomplete.htm>

### **Personal Privacy:**

It may be impossible to completely maintain the anonymity of individual students taking this course relative to grades given on assignments or exams, or final grades at the completion of the course. An alias may be used in place of each student's name in an attempt to maintain anonymity. It is the student's responsibility to insure that this alias remains confidential as the possibility exists that this and the grade(s) associated with it will be available on bulletin boards in areas open to the general public.

Also, please note that Appendix D of the University Handbook for Appointed Personnel contains the following information regarding the release of student information as set forth by the Family Educational Rights and Privacy Act of 1974. Pertinent sections of this Appendix are reproduced below. This information may be important if you ask any of the instructors to write a letter of recommendation for you. Again, if you have any questions or concerns, ask the instructors first.

#### **II. CONFIDENTIALITY OF STUDENT RECORDS**

A student's educational records (or personally identifiable information contained therein), other than directory information, shall not be accessible or released without the prior consent of the student unless authorized by law. Federal law recognizes that student educational records may be released, without prior consent of the student, under the following circumstances or to the following individuals:

1. Other officials of the University, including teachers, who have a legitimate educational interest in the information.
2. Officials of other schools in which the student seeks or intends to enroll, on the condition that the student upon request receives a copy of the record which has been transferred and has an opportunity to challenge upon request the content of the record.

**Schedule, RA M 436A/536A, Spring 2007** (This schedule may change. Be sure to regularly check for the most recent version on the web at <http://ag.arizona.edu/classes/ram436/>):

Week	Date	Topic	Reading
1	10 Jan	<b>Lecture: 1. Course Introduction &amp; mechanics; Your knowledge in Grazing Ecology and Management. Electronic tutorial: 1a. What is grazing? What are rangelands? *</b> (Be sure to print and complete Pre-semester questionnaire if you have not done this already.)	<a href="#">Chapt 1, Holechek et al.</a>
2	15 Jan	<b>Holiday - NO CLASS</b>	
	17 Jan	<b>Lecture: 1a. Examples of prototypical rangeland ecosystems:</b> Shortgrass prairie; Desert Grassland	p. 85-87, 90-94 Holechek et al.
3	22 Jan		<a href="#">Chapt 1, H &amp; S</a>
	24 Jan	<b>Lecture: 2. Developing an ecological perspective of grazing*</b> - Basic features of ecological systems and the roles that herbivores may play within them	
4	29 Jan		
	31 Jan	<b>Lecture: 3. Responses of individual plants to grazing*</b> - Plant morphology and physiology; grazing resistance	<a href="#">Chapt 4 (p.85-102), H &amp; S</a>
5	5 Feb		
	7 Feb	<b>Lecture: 4. Population and community responses to grazing</b> - Succession; range condition	<a href="#">Chapt. 4, (p. 102-108); Chapt. 5, H &amp; S</a>
6	12 Feb		
	14 Feb	<b>Lecture: 4a. Herbivore-induced vegetation change*</b> - Basic mechanisms; increases in woody plant density in southern Arizona	
7	19 Feb	<b>Group discussion:</b> Is HIVC inevitable? What can we do now? Open review for exam.	
	21 Feb	<b>Exam 1</b> – covers material through 20 Feb → Sample exam questions	
8	26 Feb	<b>Lecture: 5a. Ecosystem responses to grazing</b> - Introduction to ecosystems and grazing influences on the hydrological cycle	<a href="#">Chapt. 6, H &amp; S</a>
	28 Feb	<b>Electronic tutorial: 5b. Ecosystem responses to grazing</b> - Biotic invasions and grazing, cheatgrass in the Great Basin as an example* <b>Group discussion here:</b> How can grazing management affect invasive plants?	
9	5 Mar	<b>Lecture: 6a. Considering the grazer*</b> - Comparative anatomy and nutritional requirements; nutritive value of forages; diet selection and foraging behavior	<a href="#">Chapt. 3, H &amp; S</a>
	7 Mar	<b>Lecture: 7a. Principles of grazing management</b> - Introduction to livestock production systems; grazing capacity; number of animals; kind and class of livestock; spatial and temporal distribution; stocking rate calculations. <a href="#">Grazing management terms</a>	<a href="#">Chapt. 7, H &amp; S</a>

	10-18 Mar	<b>SPRING BREAK</b>	
10	19 Mar	<b>Lecture: 7a. Principles of grazing management</b> – Continued; mixed-species grazing. <b>Electronic tutorial: 7a. Sample stocking rate calculations (Stocking Rate Calculator assignment, due 2 April)</b>	Scoones, 1995
	21 Mar		
11	26 Mar	<b>Lecture: 7b. Principles of grazing management</b> - Grazing systems	
	28 Mar		
12	2 Apr	<b>Lecture: 7c. Principles of grazing management</b> - Management considerations in variable environments; Open review for exam.	p. 424-430, Holechek et al.\
	4 Apr		
13	9 Apr	<b>Lecture: 7d. Principles of grazing management</b> – Range livestock production in Arizona; Assignments made for Group Review for Final Exam	Who gets to graze the range?
	11 Apr		
14	16 Apr	<b>Lecture: 8b. Special grazing management situations:</b> Riparian areas	
	18 Apr		
15	23 Apr	<b>Lecture: 9b. Where from here?</b> Public perceptions of (livestock) grazing	National Public Lands Grazing Campaign; Stewards of the Range
	25 Apr		
16	30 Apr	<b>Group Review for Final Exam</b> (Assignments made on 10 April)	
	2 May		
<b>Final exam (comprehensive) – 8:00-10:00 AM, Friday 11 May</b>			

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