NR678: Advanced Ecological Restoration
Department of Forest and Rangeland Stewardship
Warner College of Natural Resources

COURSE SYLLABUS

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Teaching Assistant</th>
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<td>Name: Mark Paschke</td>
<td>Andrea Borkenhagen</td>
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<td>E-Mail: <a href="mailto:Mark.Paschke@colostate.edu">Mark.Paschke@colostate.edu</a></td>
<td>Wednesdays and Thursdays 10-12; or by appointment</td>
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<tr>
<td>Office Hours: I have an open door policy. When my door is open feel free to stop by anytime. If you have trouble catching me, send me an email, or call to set up an appointment</td>
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<tr>
<td>Website: <a href="http://warnercnr.colostate.edu/research-and-outreach/departmental-research/rel">http://warnercnr.colostate.edu/research-and-outreach/departmental-research/rel</a></td>
<td><a href="http://warnercnr.colostate.edu/~davidc/David_Cooper/Current_Students">http://warnercnr.colostate.edu/~davidc/David_Cooper/Current_Students</a>, Researchers, Alumni.html</td>
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Term: Spring 2016
Class Meeting Days: MWF
Class Meeting Hours: 12:00 – 12:50
Recitation: 1:00-1:50 Wednesdays
Class Location: 113 Natural Resources
Recitation Location: 212 Forestry
Course Credits: 4

Course Overview
The field of Ecological Restoration is a complex interdisciplinary field that is becoming more important in a world that depends on increasingly degraded ecosystems to support growing human societies. Ongoing human disturbances associated with urbanization, energy development, climate change, poor land management, and pollution create the need for professionals that can restore services to degraded ecosystems. Restoration of degraded ecosystems benefits society by improving biodiversity conservation, improving human livelihoods, empowering local people, and improving ecosystem productivity. This course is intended to provide you with an understanding of the process of assisting in the recovery of damaged, degraded or destroyed ecosystems. The greatest amount of attention will be given to drastically disturbed lands, but the principles and concepts will have application to a wide variety of disturbance scenarios.

Course Goals and Objectives
The goal of this class is to provide you with the skills and knowledge that you would need to lead a multidisciplinary team in the restoration of any ecosystem that has been degraded, damaged or destroyed. The class will focus on the underlying principles and approaches used in ecological restoration. Upon completing this class, students will:

- Be able to articulate the historical development of restoration concepts and the role that restoration can serve in the future stewardship of natural resources,
• Be able to describe the major ecological principles underlying the successful restoration of ecosystems including concepts of disturbance and sucession,
• Be able to use ecological and management principles and select appropriate methods and tools for designing and conducting restoration projects,
• Be capable of discerning elements of successful versus failed restoration projects

Students will demonstrate proficiency in these areas in the classroom during student presentations, quizzes, written assignments and examinations.

Course Prerequisites
In order to be successful in this class, students need to already have a thorough understanding of ecology as well as familiarity with basic soil science. Specific CSU prerequisites are: 1) BZ 450 or F 311 or LAND 220/LIFE 220; 2) SOCR 240.

Required Texts and Materials
There are no required texts for this course but there will be numerous reading assignments posted on RamCT. You will be expected to read these assignments prior to coming to class in order to fully understand lecture material and engage in discussions of the reading assignments.

Important Dates to Remember
Classes Begin: Jan 20th 2016
End Restricted Drop Classes: Jan 22nd 2016
Spring Break: March 14th – 18th, 2016
Withdrawal Deadline: March 21st 2016
Final Examination: May 11th 4:10-6:10

Schedule of Topics
1) Introduction to Ecological Restoration
   a) Historical development
   b) Role in stewardship
   c) Future needs
2) Ecological Concepts
   a) Ecological Succession
   b) Reference conditions
3) Restoration Process
   a) Steps in the Process
   b) Understanding Limitations
      i) Biological Limitations
      ii) Physical Limitations
      iii) Chemical Limitations
   c) Overcoming Limitations (a few examples)
      i) Revegetation
      ii) Mulching
      iii) Equipment/Tools
      iv) Phytoremediation
      v) Collaborative Restoration
4) Restoration in Various Settings (examples)
a) Wetlands  
b) Rivers  
c) Wildlife  
d) Temperate Forests  
e) Grasslands  
f) Tropical Forests

**Basis for Final Grade**

In order to meet the learning objectives of this course you will be evaluated based upon your performance/participation on the following:

- Twelve pop quizzes. The quizzes will have a value of 5 points each for a total of **50 points** (lowest two scores will be dropped). These quizzes will be unannounced, and will cover reading and lecture material. Quizzes will be given at the beginning of class (12:01pm). If you are late for class, you WILL miss the quiz. There will be no make-up quizzes, but you can drop 2. The purpose of quizzes is to ensure that students are understanding course material and allow the instructor to revisit material to ensure that learning outcomes are met.

- Five short (one-page) papers will be assigned during the semester. **Each will be worth 10 points.**

- There will be one group written assignment (**75 points**). A significant portion of the grade for this project will be participation as judged by your fellow group members.

- There will be three exams and a final exam. **Each exam will be worth 100 points.** The final exam will be comprehensive and will have a value of **100 points.**

- There will be a review session prior to each of the three exams. Participation in these review sessions will be worth **25 points each.** During the review session students will write the exam questions. I allow students to write exam questions not because I am lazy, but rather because it allows us as a class to discuss and decide what material is important for students to understand in order to meet the course learning objectives.

- **Participate in weekly discussion sections (75 points) and lead one discussion (25 points).**

- **Extra Credit – Participate in or lead local restoration projects with Wildland Restoration Volunteers. Each Saturday project that you participate in will be worth 10 points. You may earn a maximum of 30 points of extra credit.** I DO NOT allow any other activities to substitute as extra credit for these WRV projects.

There will be approximately 750 points awarded during the semester but this might change, as the instructor reserves the right to add or delete assignments as needed to ensure learning objectives are being met.

Grading will be on a scale of > 90% = A; 80 to 89% = B; 70 to 79% = C; 60 to 69% = D; <60% = F. The +/- system will not be used in this class.
Course Policies

Late Work Policy:
Late assignments will be penalized 10% of the earned grade per day that the assignment is late (including weekend days). Turning in assignments by email is acceptable.

Extra Credit Policy:
You may earn a maximum of 30 points of extra credit by participating in WRV projects as described above.

Grades of "Incomplete":
Per university policy, an instructor may assign temporary grade of Incomplete to a student who demonstrates that he or she could not complete the requirements of the course due to circumstances beyond the student's control and not reasonably foreseeable. A student must be passing a course at the time that an Incomplete is requested unless the instructor determines that there are extenuating circumstances to assign an Incomplete to a student who is not passing the course. When an instructor assigns an Incomplete, he or she shall specify in writing using the Department Incomplete Grade Form the requirements the student shall fulfill to complete the course as well as the reasons for granting an Incomplete when the student is not passing the course. The instructor shall retain a copy of this statement in his or her grade records and provide copies to the student and the department head or his or her designee. (Section I.6 of the Academic Faculty and Administrative Professional Manual)

Disability Access:
Colorado State University is committed to providing reasonable accommodations for all persons with disabilities. Students with disabilities who need accommodations must first contact Resources for Disabled Students before requesting accommodations from the professor. Resources for Disabled Students (RDS; http://rds.colostate.edu/home) is located in room 100 of the General Services Building. Their phone is (970) 491-6385 (V/TDD). Students who need accommodations in this course must contact the professor at the beginning of the semester to discuss needed accommodations.

Attendance Policy:
Lecture materials will be posted on RamCT but this is not intended as a substitute for attending class. Guest lectures may, or may not be posted. Regular attendance of class is expected and encouraged. There will be pop quizzes throughout the semester and there are NO MAKEUP QUIZZES or EXAMS. Rescheduling of exams is only possible for official University-sanctioned activities and medical issues.

Religious Accommodation:
Participation in official University activities, e.g., an out-of-town athletic event, or special religious observances may provide a legitimate reason for an excused absence. The student is responsible for discussing this with the instructor at the beginning of the semester.

Final Exam Policy:
Final examination week is part of the regular semester. Student attendance shall be consistent with University policy.

If a student has three or more final examinations (not classes) scheduled for the same day or if conflicts of examination times occur, the student may negotiate a time change with the instructors involved. If the parties involved cannot find a mutually agreeable time, the Registrar’s Office indicates which courses must be changed.
Note: The Registrar’s Office must be notified at least one week prior to Final Examination Week to allow instructors time to make appropriate accommodations. It is the student’s responsibility to initiate negotiations.

Any student who has a conflict with the examination schedule must inform the instructor as soon as possible before the examination. If an agreement cannot be reached between the instructor and student as to the appropriateness of a make-up examination the student should appeal to the department head.

http://www.registrar.colostate.edu/final-exams

Professionalism Policy:
Per university policy and classroom etiquette; all electronic devices must be silenced during all classroom and lab lectures. Those not heeding this rule will be asked to leave the classroom/lab immediately so as to not disrupt the learning environment. Please arrive on time for all class meetings. Students who habitually disturb the class by talking, arriving late, etc., and have been warned may suffer a reduction in their final class grade.

When emailing the instructor, please include your full name, and the course number in your email.

Academic Integrity:
The Department of Forest and Rangeland Stewardship takes academic integrity seriously. At minimum, academic integrity means that no one will use another's work as their own. The CSU writing center defines plagiarism this way:

Plagiarism is the unauthorized or unacknowledged use of another person's academic or scholarly work. Done on purpose, it is cheating. Done accidentally, it is no less serious. Regardless of how it occurs, plagiarism is a theft of intellectual property and a violation of an ironclad rule demanding "credit be given where credit is due."


If you plagiarize in your work you could lose credit for the plagiarized work, fail the assignment, or fail the course. Each instance of plagiarism, classroom cheating, and other types of academic dishonesty will be addressed according to the principles published in the CSU General Catalog (see page seven, column two: http://www.catalog.colostate.edu/FrontPDF/1.6POLICIES1112f.pdf).

Of course, academic integrity means more than just avoiding plagiarism. It also involves doing your own reading and studying. It includes regular class attendance, careful consideration of all class materials, and engagement with the class and your fellow students. Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, we will ask to you sign the CSU Honor Pledge as part of completing all of our major assignments. While you will not be required to sign the honor pledge, we will ask each of you to write and sign the following statement on your papers and exams:

"I have not given, received, or used any unauthorized assistance."