



**SCED 560, Principles and Teaching of Ecology (3 credits)**  
On-line Course

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 Office Hours: By appointment  
 Required Texts: [\*From Grassland to Glacier\*](#), 2<sup>nd</sup> Edition by C. F. Mutel and J. C. Emerick

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***Purpose of the Course***

Ecological concepts, such as natural history, species interactions, ecosystems and global systems, are explored together with pedagogical strategies appropriate for teaching of these ecological principles to elementary, middle, or secondary students. This course is designed to help in-service teachers meet the [“Highly Qualified” teacher status](#) as designated by the Colorado State Board of Education plan to be in compliance with Sec. 1119 of the No Child Left Behind Act. The course is standards-based. It is intended for teachers who wish to increase their content knowledge in biology (specifically ecology) and integrate this knowledge into their teaching.

***Course Objectives***

1. To increase teachers’ knowledge of major ecological principles.
2. To increase teachers’ knowledge of inquiry through computer simulations and field investigations.
3. To explore and describe the major ecosystems of Colorado.
4. To explore pedagogical strategies for incorporating the investigation of ecology in secondary curricula.
5. To support teacher participants in improving instructional and professional practices, including:
  - Supporting the learning of all students
  - Using higher level questions to increase student understanding
  - Assessing student thinking and evaluating instructional tasks
  - Planning and communicating with other teacher participants
6. To provide content necessary to enable practicing teachers to address [K-12 Colorado Model Content Standards in Science](#), [National Science Education Standards](#) and the [Project 2061 Benchmarks](#).

***Prerequisites***

none

### ***Format of Course***

The nature of this class is for you to learn about ecology and the teaching of ecology through a series of on-line lessons and asynchronous discussions with other members of the course via Blackboard. Several of the lessons will require you to explore ecosystems in the field and communicate the observations to the other members of the course. You will conduct several on-line ecological investigations to make observations and create models describing what you see. You will also conduct a field investigation where you will pose a hypothesis, design an experiment, use the appropriate ecological protocols to collect the data, analyze the data, and report your findings to the other students. Since this is a distance learning format, you will be required to communicate electronically and form networks with other participants. You need to have good communication skills.

The course requires some technical knowledge to facilitate the online delivery. You should be able to download and upload documents and spreadsheets from Blackboard, communicate in MS Word or other word processing software, manipulate data in MS Excel or other spreadsheet application, download and use modeling software, and send and receive e-mail. While this course can be done on a 56K dialup modem, higher speed access is recommended. You must have an Internet Browser and Microsoft Office (or equivalent). Some documents are available in the Adobe PDF format so you must download the free [Adobe® Reader® 7.0](#).

### ***Survival tip:***

The nature of scientific research and of this class is to harness the power of collaboration. You are strongly encouraged for formulate collegial relationships, both in and outside of class. You will be asked to stretch your science knowledge, knowledge about inquiry, and your technology skills. Thus, frustration is the norm and proper management will lead to success. (Aren't all scientists a *little insane?*)

### ***Outline of Course Content:***

The *general* outline of topics is as follows:

1. Introduction to Course
2. Ecology as a Study of Interconnections
3. Natural History
4. Interactions
5. Communities and ecosystems
6. Large-scale ecology

### ***Grading and Attendance:***

The final grade for the course will be derived from the following activities:

<i>Method of Assessment</i>	<i>Approximate weight</i>
Active Participation in Online Discussions	40%
Assignments (field guide, models, etc)	40%
Ecological Investigation and Report	20%

In most cases, a scoring rubric will be provided for any assessment items to guide you in preparing for the assignment. The nature of this course is on-line delivery and participation in the course activities is expected for all students. Failure to participate in discussions or complete assignments impact the overall grade received for the course.

### ***Method of Evaluation***

The course will be graded by the standard A-F letter grade. The final course grade is based on your total number of points from all forms of assessments using a 90-80-70-60 scale.

### ***Class Discussion***

Class discussion is probably the most important learning environment for this course. Scientists rarely work alone, despite society's stigma that scientists are unsocial intellects working in some smelly lab. You are strongly encouraged to form friendships that will enable you to collaborate on assignments as part of the class. All assignments will be submitted via Blackboard and due dates will be posted for each assignment. *Homework assignments will not be accepted late without prior approval. Missed class assignments will receive a zero score.*

### ***Assignments***

You are expected to become connected to a local Professional Development Provider. Many of these are parks, botanic gardens, or environmental learning centers. You will have an opportunity to get to know the ecosystem at your PDP site and through a series of assignments create the beginnings of a field guide and model ecological relationships you observe. These assignments build on each other. To make the most of these activities you will need access to a digital camera. Alternatively you can scan in regular photographs or drawings.

### ***Ecological Investigations***

To teach science as a process of inquiry, it is critical to experience first-hand the pleasure (and sometimes frustration) of conducting scientific investigations. The investigations are a series of on-line lab exercises and several field experiences. The computer simulations systematically take you through the hypothetico-deductive method of investigation (normally called the "scientific method"). In these simulations you will have the opportunity to design experiments, test hypotheses; analyze the data; and report the results. In the field experiences, you will collect observations and data from natural ecosystems. Both strategies will help you use inquiry to learn the underlying ecological principles.

### ***Using Blackboard***

This course will utilize Blackboard, a web-based course supplement, for delivering most of the material and managing on-line quizzes and discussion. Quizzes will be posted at least two days in advance of the deadline. *It is advised that you don't wait until the last minute to complete the quiz, as technical difficulties may arise and prevent you from completing the quiz on time.*

**Blackboard** is accessed at <http://bb.unco.edu>.

### ***Blackboard Login Instructions***

1. Login with the first eight characters of your UNC generated email address.
  - a. Example: REIN1234
2. Your password will be your student number. See [Bear Number](#) information.
3. If you have problems accessing Blackboard you can contact User Support at 1-4357.

### ***Disability Support Services***

Students who believe that they may need accommodations in this class are encouraged to contact the Disability Support Services (970) 351-2289 as soon as possible to ensure that accommodations are implemented in a timely fashion.

### ***Honor Code***

All members of the University of Northern Colorado community are entrusted with the responsibility to uphold and promote five fundamental values: Honesty, Trust, Respect, Fairness, and Responsibility. These core elements foster an atmosphere, inside and outside of the

classroom, which serves as a foundation and guides the UNC community's academic, professional, and personal growth. Endorsement of these core elements by students, faculty, staff, administration, and trustees strengthens the integrity and value of our academic climate.

*UNC's Policies*

UNC's policies and recommendations for academic misconduct will be followed.

***\*\*Links to UNC student handbook, honor code, and information on plagiarism. \*\****

Student Handbook: [www.unco.edu/dos/handbook/stuhndbk.htm](http://www.unco.edu/dos/handbook/stuhndbk.htm)

UNC Honor Code: [www.unco.edu/dos/honor\\_code.htm](http://www.unco.edu/dos/honor_code.htm)

Plagiarism: [www.unco.edu/dos/plagiarism.htm](http://www.unco.edu/dos/plagiarism.htm)