

Earth Systems—Weather, Climate and Climate Change II

Course Information:

Location: Crow and Northern Cheyenne Reservations, MT

Credits: 2 graduate credits

Course Instructors:

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Course Objectives:

This course combines lecture and hands-on laboratory and field experience to provide basic information on the climate system and expands on the science and pedagogical content learned in previous courses. The format combines on-line instruction and monthly 1 – 1 ½ day, on-site meetings. The course will address fundamentals and the complexities involved with weather, climate and climate change. It will provide knowledge allowing students to understand television and online weather forecasts, interpret news articles and make an informed decision on climate change, the depletion of the ozone layer, the causes and effects of ENSO, and severe weather. Topics will also include instructional methods and models, strategies for developing conceptual understanding, curriculum design, learning assessments, culturally competent instruction, and leadership development.

Text Book: *The Good Earth. Introduction to Earth Science.*

David McConnell and others. 2008. McGraw Hill.

****Additional Reading will be provided on WebCT or as links to webpages****

Course prerequisites:

The course is designed for 3rd to 8th grade science teachers, who have basic knowledge in the subject areas. Prerequisites include GEOL 580 - Earth Systems- Physical and Historical Geology, offered Fall and Spring 2007/2008 and GEOL 580-Weather, Climate, and Climate Change offered June 2008.

Attendance:

Regular attendance and completion of on-line discussions and activities is expected for the successful completion of the course. In the case of an unexcused absence, an outline of that month's chapter(s) must be completed for a grade and turned in within two weeks of the class.

Grading:

Students enrolled in the course will receive a traditional letter grade. Grades are based on participation (20%), class and on-line discussions and activities (30%) and "The Scoop" (50%). All assignments must be completed to at least a minimum standard of proficiency as specified by the instructors.

Grades will be awarded using the following scale:

90 to 100% = A 70 to 79% = C Less than 60 % = F
80 to 89% = B 60 to 69% = D

Course Schedule:

October

- Introductory Comments & Expectations
- Review of the Atmosphere
- Ozone and Atmospheric Pollution
 - Stratospheric (Good) vs Topospheric (Bad) Ozone
 - Agricultural and Urban Pollution
 - Urban Climates
 - Pollution Hotspots
- Air Masses
- Weather Mechanics Review

Complete Online Module 1 and have Module 2 started prior to the face-to-face meeting.

November

- Carbon Cycle
- Oceans and Climate
 - Thermalhaline Circulation
 - ENSO and interannual climate variations
 - Abrupt Climate Change
- Global Ocean and Atmospheric Circulation

Online Module 2 and 3 need to be completed before attending the face-to-face meeting.

December

- Global Climate Change
 - Review of causes
 - Climate Change Impacts
 - Class Observations
 - Solutions and Adaptations
- Montana Climate Change Impacts and Solutions
- Where to go from here and closing remarks.

Online Module 4 and 5 need to be completed before attending the face-to-face meeting.