

# **National Park Service Views of Earth Science Resources**

Geology 5003  
Summer 2009

Credit hours: TBD

Contact hours per term: TBD

## **Dates**

July 6 – 17

M – F            8:30 a.m. – 3:30 p.m.

## **Class location**

### **Class periods**

UCD Campus (Room TBD)

## **Field trips**

Tuesday, July 14th

Cave of the Winds parking lot - 9:00 a.m.

Thursday, July 16<sup>th</sup>

USGS Ice Core Laboratory (tentative)

Denver Federal Center - Time TBD

## **Catalog description**

GEOL 5003-2. RM-MSMSP: National Park Service Views of Earth Science Resources

Learn about the natural resources found within America's national parks, and delve into the decisions resource managers make to preserve those resources. Natural resources explored in this course include: air quality, water quality, caves and karst, fossils, stratigraphy, volcanism, glaciers, coastal geology, and global climate change. Each resource is introduced using examples from national parks. Further investigation comes through examination of real-world management scenarios and resolutions from specific parks. Critical thinking will be required as students attempt to use information gained in the course to make their own management decisions for resources issues faced by various parks. This course will make use of the "Views of the National Parks" program – an educational resource developed by the National Park Service. Field trips are scheduled to expose students to some of the resources discussed in the class as well as interact with professionals in the field.

## **Instructors and guest lecturers**

### ***Instructor***

#### **Erika Matteo**

erika\_matteo@partner.nps.gov

office: 303-987-6942

### ***Instructor***

#### **Kristen Nein**

kristen\_nein@partner.nps.gov

office: 303-969-2684

### ***Guest lecturers***

#### **Kristi Morris**

kristi\_morris@nps.gov

office: 303-969-2822

#### **Bob Higgins**

Retired, NPS

#### **Marian Higgins**

Retired, USGS

#### **Tim Connors**

tim\_connors@nps.gov

office: 303-969-2093

#### **Rebecca Beavers**

rebecca\_beavers@nps.gov

office: 303-987-6945

#### **Ron Kerbo**

Retired, NPS

#### **Bruce Nash**

bruce\_nash@nps.gov

office: 303-987-6697

#### **David Krueger**

david\_krueger@nps.gov

office: 303-969-2033

## **Course overview**

Teachers will learn about natural resources and natural resource issues in national parks, as well as develop their own management plans for preserving these resources. Guest speakers from the National Park Service (current and retired) will provide their expertise on the various natural resources and the management issues related to each. Whenever possible, actual management scenarios from parks will be used to provide a comparison between teachers' decisions and actual actions taken by park resource managers.

By learning about natural resources found within national parks, teachers will immediately gain practical examples of earth science topics. Teachers will also have hands-on experience with the "Views of the National Parks" program and learn how to incorporate this educational resource into their classes. Through the management plan creation process, teachers will engage in critical thinking exercises that show how these resources are often inter-connected, and how humans are an integral piece of the creation and resolution of many management issues.

### **I. Goals**

- Students will become more familiar with natural resources
- Students will gain understanding of issues related to these natural resources
- Students will learn how to develop management plans to resolve these issues
- Students will use critical thinking while developing their own resource management plans
- Students will meet and interact with natural resource professionals
- Students will visit several field locations to foster a connection to the resources
- Students will learn how to incorporate NPS information into their classroom, including the "Views of the National Parks" program

### **II. Outcomes**

- Students will increase their geosciences content knowledge
- Students will be exposed to real-world examples of natural resources they can use in the classroom
- Students will gain a better understanding of the inter-related nature of natural resources
- Students will be able to apply critical thinking exercises to geoscience studies
- Students will compile a notebook of information, assignments, and lessons about natural resources that they can use in their own classrooms.

### **III. Content**

Geology 5003 will provide a series of full-day experiences centered on Earth Science content. The classroom sessions will be used to introduce natural resources found within national parks, explore how teachers can bring these resources into the classroom, identify the issues surrounding each resource, and determine how management decisions are made to resolve these issues. Participants will be provided

with resources that they may use in their own classrooms, such as computer software, maps, contact lists, resource briefs, management plans, and lessons adaptable for classroom use.

#### **IV. Field trips**

This course will include 1 full-day field trip and 1 half-day field trip.

##### ***Secrets held within rocks*                      *full-day trip, July 14th***

The purpose of this field trip is to provide real-world experience of several of the natural resources presented in this course, as well as to interact with natural resource professionals in the field. Participants will receive a private tour of one of the caverns at Cave of the Winds with a retired cave resource specialist of the National Park Service. After the cave tour, the class will head to Florissant Fossil Beds, where they will learn about the paleontological resources of the park and meet the park's paleontologist and education specialist. Participants will also visit the private quarry just outside of the park where they will perform their own paleontological dig.

- In groups, teachers will complete a photo-scamenger hunt at Cave of the Winds (they will then combine and share photos for their own classroom use)
- Practice paleontological fieldwork and fossil identification
- Create interview questions for the professionals they will meet, and summarize the answers to these questions.
- Create an outline of an activity or lesson plan for use in the classroom using information from this field trip

\* All assigned work will be completed during the field trip \*

##### ***Change is in the ice*                      *half-day trip, July 16th***

The purpose of this afternoon field trip is to visit the national ice core center at the Denver Federal Center. Participants will learn about this valuable resource right in their backyard, as well as learn about how natural resources can be used to study complex issues like global climate change.

- Notebook drawings of the view of ice under a microscope
- Create interview questions for the professionals they will meet, and summarize the answers to these questions
- List applications for the research done in the Ice Core Lab
- Create an outline of an activity or lesson plan for use in the classroom using information from this field trip

\* All assigned work will be completed during the field trip \*

## V. Methodologies and strategies

This course will utilize a variety of methods and strategies to facilitate participant understanding. The course instructor will provide background information regarding the National Park Service and the "Views of the National Parks" program, as well as tying together all of the natural resource topics. Guest lecturers will be brought into the classes to provide their knowledge on each natural resource, introduce resource issues, go over management planning, and provide an opportunity for feedback. Student inquiry, research, and critical thinking within each natural resource topic will be demonstrated through course activities. Multimedia elements (computer programs, videos, and demonstrations) will enhance participant understanding of natural resources, issues, and management planning. Field trips will further enhance this understanding by first-hand experience of natural resources.

## Assignments and grading

Assignment	Percentage of grade
Class participation, attendance, and knowledge quizzes	10%
Secrets held within rock field trip project	20%
Change is in the ice field trip project	10%
Resource management plans & notebook	40%
Post assessment & presentation	20%
	100%

A	=	94 to 100%
A-	=	90 to 93%
B+	=	87 to 89%
B	=	84 to 86%
B-	=	80 to 83%
C+	=	77 to 79%
C	=	74 to 76%
C-	=	70 to 73%
D+	=	67 to 69%
D	=	64 to 66%
D-	=	60 to 63%
F	=	59% and lower

Class attendance and participation is expected and necessary. Participants will learn about a variety of natural resources, and then apply their knowledge through the creation of management plans to construct understandings of the natural resources preserved in America's national parks.

Field participation is also necessary, as it provides a valuable opportunity to experience resources in the field, and interact with professionals who deal with the issues that impact these resources. Students must be present for the field trips to be able to complete the assignments.

## **Academic honesty**

Academic honesty and integrity are vital elements of a dynamic academic institution. The responsibility for ethical conduct rests with each individual member of the academic community – students, faculty, and staff. The University of Colorado at Denver has an ongoing commitment to maintain and encourage academic integrity. Therefore, the University has created a set of standards of academic honesty and procedures governing violations of these principles. Copies of the Academic Honor Code document may be obtained at the University Library, from the GSPA office, from the Student Services office, or from the Vice Chancellor's office.

## **Forms of Academic Dishonesty**

1. *Plagiarism*: use of distinctive ideas or words belonging to another person, without adequately acknowledging that person's contribution.
2. *Cheating*: intentionally possessing, communicating, using, or attempting to use materials unauthorized by the instructor, information, notes, study aids, or other devices, in any academic exercise.
3. *Fabrication and falsification*: intentional and unauthorized alteration or invention of any information or citation in an academic exercise.
4. *Multiple submissions*: submissions of substantial portions of either written or oral academic work that has previously earned credit, when such submission is made without instructor authorization.
5. *Misuse of academic materials*: intentionally or knowingly destroying, stealing, or making inaccessible, library or other academic resource material.
6. *Complicity in academic dishonesty*: intentionally or knowingly contributing to the academic dishonesty of another.

These examples of academic dishonesty shall not be construed to be comprehensive, and infractions will be dealt with on an individual basis according to university policies

and procedures. It is the obligation of each student to assist in the enforcement of academic standards.

### **Non-discrimination policy**

The University of Colorado at Denver is committed to providing reasonable accommodation and access to programs and services to persons with disabilities. Students should contact the Disability Services Office, Arts Building 177, 303-556-8387, TTY 303-556-8484. Any other person requiring accommodation in order to access programs and services of the University of Colorado at Denver, either on or off campus, should request accommodation from the individual or office responsible for providing the program or service. This request needs to be made in a timely fashion to allow the individual or office adequate opportunity to provide reasonable accommodation.

## Tentative daily schedule (July 6 – 17, 2009)

### **Day 1**

**Monday, July 6th**

*Instructor(s):*

Erika Matteo

*Location:*

TBD

*Activities:*

- Pre-test of basic Earth science knowledge, introduction to the course, the National Park Service, and "Views of the National Parks."
- Review basic geology and social connections to resources via the "Geology of the National Mall" part of the "Views of the National Parks" program.

*Assessments:*

- Graded pre-test (grade will later be replaced by post-test)
- National Mall management planning exercise

### **Day 2**

**Tuesday, July 7th**

*Instructor(s):*

Erika Matteo, Tim Connors

*Location:*

TBD

*Activities:*

- Stratigraphy, paleontology, geologic time, introduction to the Colorado Plateau, mountain-building, and Colorado geology

*Assessments:*

- Completion of one or more exercises dealing with stratigraphy, paleontology, geologic time, and mountain building
- Relation of completed activity to Colorado Geology

### **Day 3**

**Wednesday, July 8th**

*Instructor(s):*

Erika Matteo, Bob Higgins, Marian Higgins

*Location:*

TBD

*Activities:*

- How Earth features affect history and culture
- Volcanism (dating flows, instrumentation, Hawaii Volcanoes)
- Sources of energy (Colorado emphasis)

*Assessments:*

- Volcanic hazard management plan

### **Day 4**

**Thursday, July 9th**

*Instructor(s):*

Erika Matteo, Kristi Morris

*Location:*

TBD

*Activities:*

- Atmospheric science and air quality I – introduction, ozone, acid deposition, and air pollutant effects

*Assessments:* - Airshed management activity I

**Day 5**

**Friday, July 10th**

*Instructor(s):* Erika Matteo, Kristi Morris

*Location:* TBD

*Activities:* - Atmospheric science and air quality II – monitoring air pollutants, air pollution laws and regulations, and air quality management plans

*Assessments:* - Airshed management activity II

**Day 6**

**Monday, July 13th**

*Instructor(s):* Erika Matteo, Ron Kerbo

*Location:* TBD

*Activities:* - Introduction to caves and karst landscapes  
- Cave management,  
- Ecology of caves, hydrology, and cave processes

*Assessments:* - Create skeleton of photo scavenger hunt for the field trip  
- Cave resource management plan

**Day 7**

**Tuesday, July 14th**

*Instructor(s):* Erika Matteo, Ron Kerbo, Florissant Fossil Beds staff (Jeff Wolin, Herb Meyer)

*Location:* Cave of the Winds, Florissant Fossil Beds

*Activities:* - Private tour of one cave at Cave of the Winds  
- Introduction to paleontological resources of Florissant Fossil Beds, fossil examination and classification, geologic time, climate change, and fossil dig

*Assessments:* - In groups, complete a photo-scavenger hunt at Cave of the Winds (students will then combine and share photos for their own classroom use)  
- Practice paleontological fieldwork and fossil identification  
- Create interview questions for the professionals they will meet, and summarize the answers to these questions.

**Day 8***Instructor(s):**Location:***Wednesday, July 15th**

Erika Matteo, Rebecca Beavers, David Krueger

TBD

*Activities:*

- Introduction to global climate change
- Implications to national parks
- Coastal geology
- Glaciers

*Assessments:*

- Coastal resources management plan
- Create an outline for a lesson on climate change, related to parks, glaciers, and coastal geology

**Day 9***Instructor(s):**Location:***Thursday, July 16th**

Erika Matteo, Rebecca Beavers, David Krueger

TBD, Denver Federal Center - National Ice Core Laboratory

*Activities:*

- Using coastal resources and glaciers as indicators to monitor global climate change
- Possible management scenarios

*Assessments:*

- Climate change management plan

**Day 10***Instructor(s):**Location:***Friday, July 17th**

Erika Matteo, Bruce Nash

TBD

*Activities:*

- Connecting natural resources
- Management scenarios
- Student presentations
- Introduction to additional natural resources (soils, water resources, natural sounds, night sky, etc.)

*Assessments:*

- Post-test
- Student presentations
- Notebook review
- Sharing of digital resources among the group (photos from field trips, lesson plans, management scenarios, etc.)