

UNIVERSITY OF WYOMING  
**GEOL 2220**  
**Communicating Earth Science, 3 credit hours**  
Geology Room 318  
Spring 2019  
TR 9:35-10:50

**Course instructor: Dr. Carol D. Frost**

**Contact information: [frost@uwyo.edu](mailto:frost@uwyo.edu), Office ESB 3044, office phone 307-363-1628**

**Office hours: M 2-3, R 11-1 and by appointment**

**Course prerequisites:** Grade of C or higher in GEOL 2010 and COM1 (or permission of instructor)

**Course Description:** This course fulfills the Communication 2 (COM2) requirement of the 2015 University Studies Program and is specifically designed to help majors in Geology and Geophysics become proficient in communicating science to the public. It is the responsibility of scientists to make science understandable and accessible. In this course we will address the skills necessary to present Earth science in a way that is interesting and comprehensible to people without a background in the field.

In the COM1 course, students have developed foundational skills in writing. COM3 will focus on communicating with academic or professional audiences. Through repeated instruction, practice, and feedback, the COM1-2-3 sequence emphasizes and progressively develops transferrable skills for students' academic work and future professions. This COM2 course offers an opportunity for students to develop skills for communicating science to nonscientists while emphasizing foundational oral and digital communication skills and continuing to build writing skills.

**Student Learning Outcomes: Learning objectives and outcomes:** This course is designed to fulfill the seven USP 2015 learning outcomes for COM2 courses.

1. **Breadth:** Students will make presentations to the class in the form of *written* field guides, pamphlets, press releases, and/or newspaper and magazine articles, in the form of *digital* communication through podcasts, web pages, poster presentations, radio reports (e.g. Star Date) and/or videos, and in the form of *oral* simulated ranger talks, press conferences, museum talks, company spokesperson announcements, and/or public forums and hearings.
2. **Research:** Students will choose their own topic within the theme of the course. Course themes may vary by semester or section and will include themes such as National Parks, Geologic Hazards, Geoheritage, or Earth's Resources. ***In Spring 2019 the theme will be Geoheritage. Students will select geologic features described in John McPhee's *Rising from the Plains* and prepare digital, written, and oral products to communicate the geologic significance of these features to the public.*** Students will be assisted in their research, and will learn to find, evaluate, and analyze suitable resources. We will also address proper ways to cite sources within each form of communication.

3. **Purpose and Audience:** The goal of this course is for students to become proficient in communicating with the public. We will analyze and practice communication with various types of audiences (roles will be assumed by classmates), such as interested public, hostile public, talkative audiences, protestor/heckler, and/or children. Students will focus on presenting their topic clearly, presenting material appropriate and of interest to their audience, and in organizing their messages.
4. **Process:** Each assignment will be presented to the class during workshops. Students will receive feedback from their peers as well as their instructor and will have multiple opportunities to revise their work. They will also answer questions from the class on their oral presentations.
5. **Conventions:** Students will learn to find and follow guidelines for different forms of presentation, such as format, length, structure, and content.
6. **Delivery:** Students will present each phase of their research, writing, and presentations to their workshop groups before presenting to the class. Through providing constructive criticism to their classmates, they will learn to identify effective methods of presentation. Through repeated exposure to public speaking, collaboration with their peers, and suggestions from their instructor, they will develop skills for overcoming speaking anxiety.
7. **Interaction:** Students will develop skills in interacting with an audience through question and answer sessions after their oral presentations. During these sessions, their classmates may be assigned different audience roles in which they might strongly agree or disagree with the speaker, dominate the public discussion, or be uninterested in the topic. Students will also work on engaging their audience and adjusting their presentations based on audience response.

**Required text:** *Rising from the Plains*, by John McPhee (1986). Because you will be annotating the book it is mandatory that you own a copy.

**Attendance policy:** Because of the interactive nature of this course, attendance is required. If you are absent for any reason you must write a 2-page essay summarizing the topics and readings for that class session and turn it in at the beginning of the following class period. If you fail to turn in an essay on time or you miss more than three classes without a valid university-excused absence you will automatically fail the course. University policies on excused absences are outlined in [UW Regulation 2-108 \(Student Attendance Policy\)](#).

**Late work:** Grades for late work will drop by 5% for each day late up to one week. Assignments more than 1 week late will receive no credit.

### **Grading:**

**40%--Assignments** leading up to the written, digital, and oral presentations, including an annotated bibliography of references you plan to use for your topic(s) identified from the locations described in *Rising from the Plains*. You will list each reference and follow it with brief (1-2 sentence) summary of the content that is relevant to your work. You will also turn in an updated annotated bibliography with your written assignment.

**6%--Written feedback to fellow students**—You will provide constructive written feedback to your peers on their written, digital, and oral projects.

**18%--Written Assignment** (average of score on draft and final version)— You will create a written piece, no longer than 10 pages of text, that informs the public about your topic.

You will present a draft to your workshop group and the instructor, and the final version to the class as a whole.

**18%--Digital Presentation** (average of score on draft and final version) —You will present another aspect of your topic in a digital format, first to your workshop group, and the final version to the class as a whole. The content should not be identical to your written assignment, but a different aspect of the topic that you have chosen. You will have ten minutes to introduce your digital presentation to the class and answer questions.

**18%--Oral presentation**—You will give an oral presentation to the class on your topic. The content should not be identical to your written and digital assignments, but a different aspect of the topic that you have chosen. Your presentation to the class will be 10-15 minutes with an additional 5 minutes of questions. After your oral presentation, you will field questions from your audience.

**Required Participation Outside of Class Meetings:** Students are required to attend two of the department's weekly lecture series talks: one of February 4 and one on Feb 25. Both are at 3 pm in Geology Room 216. Students are also expected to participate in Undergraduate Research Day on Saturday, April 27. There will be no class on March 12.

**Final Examination or Final Project Date:** The exam date set by the Office of the Registrar for our class is Tuesday, May 14. This is the date by which all final assignments must be turned in.

**Grading scale:** Letter grades A, B, C, D, F will be used in this class (no +/-)

### **University policies related to enrollment in UW courses:**

**Classroom Behavior Policy:** *UW expectations are that at all times, treat your presence in the classroom and your enrollment in this course as you would a job. Act professionally, arrive on time, pay attention, complete your work in a timely and professional manner, and treat all deadlines seriously. You will be respectful towards your classmates and instructor. Spirited debate and disagreement are to be expected in any classroom and all views will be heard fully, but at all times we will behave civilly and with respect towards one another. Personal attacks, offensive language, name-calling, and dismissive gestures are not warranted in a learning atmosphere. As the instructor, I have the right to dismiss you from the classroom, study sessions, electronic forums, and other areas where disruptive behavior occurs.*

*Electronic devices such as mobile phones should be turned off). Laptops are allowed for note-taking purposes. No video or audio recording during class is allowed to protect the privacy of your fellow students except as part of class assignments and activities.*

**Classroom Statement on Diversity:** *The University of Wyoming values an educational environment that is diverse, equitable, and inclusive. The diversity that students and faculty bring to class, including age, country of origin, culture, disability, economic class, ethnicity, gender identity, immigration status, linguistic, political affiliation, race, religion, sexual orientation, veteran status, worldview, and other social and cultural diversity is valued, respected, and considered a resource for learning.*

**Disability Support:** *The University of Wyoming is committed to providing equitable access to learning opportunities for all students. If you have a disability, including but not limited to physical, learning, sensory or psychological disabilities, and would like to request accommodations in this course due to your disability, please register with, and provide documentation of your disability as soon as possible to Disability Support Services (DSS), Room 128 Knight Hall. You may also contact DSS at (307) 766-3073 or [udss@uwyo.edu](mailto:udss@uwyo.edu). It is in the student's best interest to request accommodations within the first week of classes, understanding that accommodations are not retroactive. Visit the DSS website for more information at: [www.uwyo.edu/udss](http://www.uwyo.edu/udss)"*

**Academic Dishonesty Policies:** *Academic dishonesty will not be tolerated in this class. Cases of academic dishonesty will be treated in accordance with UW Regulation 2-114. The penalties for academic dishonesty can include, at my discretion, an "F" on an exam, an "F" on the class component exercise, and/or an "F" in the entire course. Academic dishonesty means anything that represents someone else's ideas as your own without attribution. It is intellectual theft – stealing - and includes (but is not limited to) unapproved assistance on examinations, plagiarism (use of any amount of another person's writings, blog posts, publications, and other materials without attributing that material to that person with citations), or fabrication of referenced information. Facilitation of another person's academic dishonesty is also considered academic dishonesty and will be treated identically.*

**Duty to Report:** *UW faculty are committed to supporting students and upholding the University's non-discrimination policy. Under Title IX, discrimination based upon sex and gender is prohibited. If you experience an incident of sex- or gender-based discrimination, we encourage you to report it. While you may talk to a faculty member, understand that as a "Responsible Employee" of the University, the faculty member MUST report information you share about the incident to the university's Title IX Coordinator (you may choose whether you or anyone involved is identified by name). If you would like to speak with someone who may be able to afford you privacy or confidentiality, there are people who can meet with you. Faculty can help direct you or you may find info about UW policy and resources at <http://www.uwyo.edu/reportit>*

*You do not have to go through the experience alone. Assistance and resources are available, and you are not required to make a formal complaint or participate in an investigation to access them.*

**Substantive changes to syllabus:** *All deadlines, requirements, and course structure is subject to change if deemed necessary by the instructor. Students will be notified verbally in class, on our WyoCourses page announcement, and/or via email of these changes.*

**Student Resources:**

DISABILITY SUPPORT SERVICES: [udss@uwyo.edu](mailto:udss@uwyo.edu), 766-3073, 128 Knight Hall, [www.uwyo.edu/udss](http://www.uwyo.edu/udss)

COUNSELING CENTER: [uccstaff@uwyo.edu](mailto:uccstaff@uwyo.edu), 766-2187, 766-8989 (After hours), 341 Knight Hall, [www.uwyo.edu/ucc](http://www.uwyo.edu/ucc)

ACADEMIC AFFAIRS: 766-4286, 312 Old Main, [www.uwyo.edu/acadaffairs](http://www.uwyo.edu/acadaffairs)

DEAN OF STUDENTS OFFICE: [dos@uwyo.edu](mailto:dos@uwyo.edu), 766-3296, 128 Knight Hall, [www.uwyo.edu/dos](http://www.uwyo.edu/dos)

UW POLICE DEPARTMENT: [uwpd@uwyo.edu](mailto:uwpd@uwyo.edu), 766-5179, 1426 E Flint St, [www.uwyo.edu/uwpd](http://www.uwyo.edu/uwpd)

STUDENT CODE OF CONDUCT WEBSITE: [www.uwyo.edu/dos/conduct](http://www.uwyo.edu/dos/conduct)

**Provisional course schedule: Spring 2019**

*Note: dates, topics, and assignments subject to change as deemed necessary by the instructor. Any changes will be announced in class and on WyoCourses or via email.*

**Week 1: January 29 and 31**Introduction to Geoheritage

America's Geologic Heritage: an invitation to leadership

([https://www.nps.gov/subjects/geology/upload/GH\\_Publicaton\\_Final.pdf](https://www.nps.gov/subjects/geology/upload/GH_Publicaton_Final.pdf))

How Earth Made Us. Episode 1: Deep Earth (<https://vimeo.com/20074359>)

*Assignment due Feb 5:* Read Stewart and Nield, 2013, Earth Stories, Proceeding of the Geologists' Association, v. 124, p 699-712. *Complete reading questionnaire: Does Stewart follow his own advice? (% of total grade = 4%)*

**Week 2: Feb 4, 5 and 7**

Scientific ethics: Attend Feb 4, 3 pm lecture in Room 216 by Dr. David Abbott, AAPG lecturer

*Assignment due Feb 12: Summarize lecture with a 1-2 page outline (2%)*

Analysis of *Rising from the Plains*: Read p. 1-72 before Feb 5 class and p. 72-133 before Feb 7 class. Make annotations in the margins of your book as you read, noting significant/interesting geologic features described, relationship of geology to people, effective language. Chart on a map of Wyoming the chronology of travels as related by the author.

*Assignment due Feb 12:* Write 1-2 pages describing what you see as McPhee's purpose, audience, and the prior knowledge he assumes of his audience. (4%)

**Week 3: Feb 12 and 14**

Analysis of *Rising from the Plains*: Read remainder of book before Feb 12 class. Read McPhee's essay, "Structure" in *The New Yorker*, Jan 14, 2013

(<https://www.newyorker.com/magazine/2013/01/14/structure>) before class on Feb 14.

*Assignment due Feb. 19:* Turn in your annotated copy of McPhee and map of Wyoming. Draw the structure of *Rising from the Plains* as you see it. (4%)

**Week 4: Feb 19 and 21**

A Geologic Companion to *Rising from the Plains*: topics, methods, and models

We will discuss possible geologic features for your projects, look at and critique geoheritage webpages, and learn library research tools.

*Assignment due Feb 26:* Choose three geological features from the book and prepare an annotated bibliography of three sources for each. (4%)

**Week 5: Feb 25, 26 and 28**

Lecture on Yellowstone: Attend Feb 25, 3 pm lecture in Room 216 by Dr. Lisa Morgan, USGS

*Assignment due March 5: Summarize lecture with a 1-2 page outline (2%)*

Know your audience: community attitudes to science and scientific integrity:

Community Attitudes to Science and Technology in Australia, CSIRO

(<https://publications.csiro.au/rpr/download?pid=csiro:EP145330&dsid=DS1>)

Science and technology: public attitudes and understanding

(<https://www.nsf.gov/statistics/2018/nsb20181/report/sections/science-and-technology-public-attitudes-and-understanding/public-attitudes-about-s-t-in-general#confidence-in-the-science-community-s-leadership>)

Geological reasoning: geology as an interpretive and historical science. Geological Society of America Bulletin, v. 107, p. 960-968.

Guide to ethical writing (<https://ori.hhs.gov/avoiding-plagiarism-self-plagiarism-and-other-questionable-writing-practices-guide-ethical-writing>)

*Assignment due March 5:* 1. Find a cartoon of a geoscientist and describe what it says about public perceptions. 2. Complete the paraphrasing/plagiarism exercise of the module, “avoiding plagiarism...” above. (4%)

### **Week 6: March 5 and 7**

Geoscience news stories: Read AGU’s prize-winning news stories of 2018 and Rehman, 2013.

AGU Walter Sullivan Award for Excellence in Science Journalism—Features to Douglas Fox (<https://www.hcn.org/issues/49.6/inside-the-dangerous-and-unpredictable-behavior-of-wildfire>)

AGU David Perlman Award for Excellence in Science Journalism—News to Shannon Hall (<https://www.scientificamerican.com/article/earths-tectonic-activity-may-be-crucial-for-life-and-rare-in-our-galaxy/>)

Rehman, Jalees, 16 May 2013, The need for critical science journalism. The Guardian.

(<https://www.theguardian.com/science/blog/2013/may/16/need-for-critical-science-journalism>)

*Assignment due March 12:* Do you think Rehman would consider the prize-winning news stories “critical science journalism”? Explain in 3-5 pages. (4%)

Communicating geoscience: Videolink with Dr. Cheadle from a scientific oceanographic cruise.

### **Week 7: March 12 and 14**

March 12: NO CLASS

March 14: Oral communication: Effective TED talks

What geoscientists can learn from TED talks (<https://www.earthmagazine.org/article/geologic-column-what-geoscientists-can-learn-ted-talks>)

How we unearthed the Spinosaurus – Nizar Ibrahim

([https://www.ted.com/talks/nizar\\_ibrahim\\_how\\_we\\_unearthed\\_the\\_spinosaurus](https://www.ted.com/talks/nizar_ibrahim_how_we_unearthed_the_spinosaurus))

Anderson, 2013, How to give a killer presentation. Harvard Business Review

(<https://hbr.org/2013/06/how-to-give-a-killer-presentation>)

*Assignment due March 26:* View the TED style talk of your choice on a geology topic and critique it using the advice from Anderson. (4%)

### **SPRING BREAK March 18-22**

### **Week 8: March 26 and 28**

March 26 Jargon and Delivery:

Vocabulary and jargon (<https://sharingscience.agu.org/jargon-and-how-to-avoid-it/>)

1000 most common words in English (<https://www.ef.com/wwen/english-resources/english-vocabulary/top-1000-words/>)

Science in ten hundred words: the up-goer five challenge

(<https://blogs.scientificamerican.com/guest-blog/science-in-ten-hundred-words-the-up-goer-five-challenge/>)

Up Goer Five, by xkcd (<https://xkcd.com/1133/>)

*Assignment due April 2 in class:* Explain one of your geologic features from *Rising from the Plains* using the ten hundred most common words. (2%)

March 28 AHC research strategies with Ginny Kilander, Reference Services Manager, AHC

*Assignment due April 4 in class:* Find and share one or more historical items related one of your geologic features held in the AHC or elsewhere. (2%)

### **Week 9: April 2 and 4**

Communicating about geological features from *Rising from the Plains*:

April 2: The Up-Goer Five challenge presentations

April 4: Sharing our AHC finds

### **Week 10: April 9 and 11**

Visual communication: maps, stratigraphic columns, graphs, images

Dutrow, 2007, Visual communication: do you see what I see? Elements 3, 119-126.

Norvin parody Powerpoint ([www.norvin.com/Gettysburg](http://www.norvin.com/Gettysburg))

Tufte, 1990, Micro/macro readings, *In Envisioning Information*, Graphics Press, p 36-51.

Pb soil depth maps, USGS Open File Report 2014-1082

(<https://mrdata.usgs.gov/soilgeochemistry/#/detail/element/82>)

Designing digital communications (<http://www.craftofscientificposters.com/design.html>)

*Assignment due April 16:* prepare a first draft of your contribution to the class Undergraduate Research Day project. (4%)

### **Week 11: April 16 and 18**

Earth science literacy principles (<http://www.earthscienceliteracy.org/>)

Writer's block: Read John McPhee's Draft No. 4, New Yorker April 29, 2013

(<https://www.newyorker.com/magazine/2013/04/29/draft-no-4>)

Planning our class submission for Undergraduate Research Day (April 27)

### **Week 12: April 23 and 25, and 27**

Expo: Digital presentations for peer evaluation. (20%, including feedback to other students.

*Revisions accepted until May 14 and grade is based on final version.)*

Final preparations for Undergraduate Research Day

### **Week 13: April 30 and May 2**

Bookstore: Written presentations for peer evaluation (20%, including feedback to other students.

*Revisions accepted until May 14 and grade is based on final version.)*

### **Week 14: May 7 and 9**

Conference: Oral presentations for peer evaluation (20%, including feedback to other students)

**May 14, 2019:** Final versions of digital and written presentations due to instructor by 5 pm.