COLORADOSCHOOLOFMINES

Course Title: Communication of Environmental Information
EBGN 598
Online Course – Fall 2016

Instructor: Dr. Jill Engel-Cox, jill.engelcox@gmail.com

The best way to contact me is via email. I will respond to your inquiry within 24-48 hours. If an issue is urgent, please indicate "urgent" within the subject line of the email. If the inquiry would be of interest to other students, you are encouraged to use the "General Questions" discussion thread.

Office hours: Office hours will primarily be conducted through the "General Questions" discussion thread or private email at address above. I will try to respond to posts within 24-48 hours. I can have one-on-one teleconferences on request.

Structure and location: The class will be offered online only.

Canvas link: https://mines.instructure.com/courses/16

Instructional activity: Each week includes approximately 20-25 minutes of video lecture, 60-90 minutes of reading, 30-60 minutes discussion, and highly interactive assignments that will take 8-10 hours to complete.

Course designation: Elective

Course description:

Communication is an essential part of being a scientist and engineer. This course provides students and early-mid career professionals with the opportunity to develop their skills for communicating scientific data and sustainable engineering design to stakeholders, including scientists and engineers in different fields, policy decision-makers, and the interested public. The course covers the importance of clear communication of complex information for the development and acceptance of technologies, public policy, and community-based environmental initiatives. Methods of engagement and design of key messages are defined for global, national, and local issues of student interest. The emphasis of the course is from the point of view of a science or engineering professional (not marketing professional) and how they can develop an effective science and technology-based communications portfolio to share complex information with a broad range of interested parties. The class is highly experiential, with the students developing a wide variety of communication materials around a topic of their choice.

Textbook and/or other requirement materials:

- Hund, G., Engel-Cox, J., and Fowler, K. (2015). A Communications Guide for Sustainable Development, Tri-Press. (Second edition). Available as eBook on Amazon, Barnes & Noble, and Apple iBooks. Hardcopy first editions also available from 3rd party sellers via Amazon.
- Tufte, E. (2001). The Visual Display of Quantitative Information, Graphics Press. Available as hardcopy book on Amazon and Barnes & Noble or from Graphics Press at http://www.edwardtufte.com/tufte/index.
- Tufte, E. (1990). Envisioning Information, Graphics Press. Available as hardcopy book on Amazon and Barnes & Noble or from Graphics Press at http://www.edwardtufte.com/tufte/index.
- Tufte, E. (1997). Visual and Statistical Thinking: Displays of Evidence for Making Decisions, Graphics Press. Available as eBook at http://www.edwardtufte.com/tufte/ebooks.

Student learning outcomes: At the conclusion of the class students will be able to:

1. Identify and explain communication methods and media for scientific and technical information
2. Prepare and present complex technical data to a wide variety of audiences
3. Engage with stakeholders to obtain information and incorporate it into their own work

Brief list of topics covered:

1. The importance of communicating science
2. Methods of engagement for global, national, and local issues
3. Types of interested parties, communication levels of detail, and messaging
4. Written communications including graphs, maps, and articles
5. Interactive communications, including survey analysis, facilitation, citizen science, and big data
6. Online communications, including both short- and long-form media
7. Overall science communications portfolios

Policy on academic integrity/misconduct:

The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining an fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.

Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.

The complete policy is online.

Grading Procedures and Homework:

It is expected that each class will take approximately 10-12 hours per week to complete. Most assignments will be generally short enough to complete in one week and designed to develop knowledge and skills. For the majority of the assignments, students will develop materials on a topic of their choice related to their work or an area of interest, applying each skill to that topic throughout the class. These materials will be compiled as a final portfolio project at the end of the semester. This course will consist of three basic student requirements:

1. **Assignments and Quizzes** (60% of Final Grade Calculation)

   Assignments include a mix of qualitative assignments (e.g., short reports) and quantitative problem sets. Quizzes are a short set of multiple choice or short answer questions.

   Qualitative assignments are evaluated by the quality and completeness of the assignment. Quantitative assignments are evaluated by the technical approach as well as achieving the correct answer; however, if the final answer is in error but the methodology is correct, then only a few points will be deducted. Therefore, it is very important to show work in full.

All assignments are due according to the dates provided. Late submissions will be reduced by one letter grade for each week late. If an assignment is more than 3 weeks late, then it will receive a grade of 0. For example, when the grades for Module 5 are completed, then any assignments not turned in for Module 2 will receive a 0.

2. **Final Communication Portfolio** (20% of Final Grade Calculation)

   Each student will select a scientific or engineering area that they are currently knowledgeable of and have data and information. The final assignment is a compilation and enhancement of the communications prepared on this topic as part of some of the assignments, as well as a presentation describing this portfolio. This final portfolio and presentation will be reviewed as a consolidated approach to communicate complex topics to different audiences.

3. **Participation (Class Discussions)** (20% of Final Grade Calculation)

   The discussions in this class require posting some of the assignments to share and discuss with other students. Feedback received on the assignments related to the class project should be incorporated into the final portfolio. Thus, online discussion is an essential and required part of the class. Each student is responsible for carefully reading all assigned material and being prepared for online discussion. Discussion is interaction (i.e., responding to classmate postings with thoughtful responses) with at least two classmates. Evaluation of participation is based on contribution to discussions, in terms of quality, timeliness, and number of interactions.

Coursework Return Policy: Grading will generally be within one week of submission.

Absence Policy: As an online course that allows for flexible schedules, students are expected to submit assignments on time and participate in discussions in a timely manner.

Detailed Course Schedule:

Module	Start Date -End Date	Topic	Assignments	Est. Time to Complete (hrs)*	Due Date	Points
Module 1	Aug 22 - Aug 28	Course Introduction and Importance of scientific communication	Discussion: Student Introductions	1	Aug 28	5
			Quiz on Syllabus	1	Aug 28	10
			A#1: Describe Your Work Challenge	3	Aug 28	15
			Discussion of Describe Your Work	1	Aug 29	15
Module 2	Aug 29 - Sep 4	Overview of methods and principles of scientific communication	A#1: Methods identification assignment	5	Sep 4	20
			A#2: Critical review of examples	5	Sep 4	30
			Discussion of critical review example	1	Sep 5	15
Module 3	Sep 5 - Sep 11	Types of interested parties and levels of communications	A#1: Prep of info for different audiences with same dataset	10	Sep 11	30
			Discussion of info for one audience	1	Sep 12	15
Module 4	Sep 12 - Sep 18	Messaging in scientific communications	A#1: Selection and description of topic for individual class project	4	Sep 18	20
			Discussion of chosen project topic	1	Sep 19	15
			A#2: Case study review of examples	6	Sep 18	30
Module 5	Sep 19 - Sep 25	Written Communication: Data graphics	A#1: Graphics principles assignment	4	Sep 25	20
			A#2: Graphic preparation for multiple audiences	8	Sep 25	45
			Discussion of graphic	1	Sep 26	15
Module 6	Sep 26 - Oct 2	Written Communication: Geospatial data and maps	A#1: Mapping concepts assignment	4	Oct 2	20
			A#2: Map preparation with analysis on messaging and audience	7	Oct 2	30
			Discussion of map	1	Oct 3	15
Module 7	Oct 3 - Oct 9	Written Communication: Articles and books	A#1: Critical review of articles	4	Oct 9	20
			A#2: Preparation of three articles for 3 audiences	8	Oct 9	45
			Discussion of article	1	Oct 10	15
Module 8	Oct 10 - Oct 23	Interactive: Surveys and analysis	A#1: IRB online training for Social and Behavioral Research	6	Oct 16	28
			A#2: Design survey	4	Oct 16	25
			Discussion and respond to surveys	2	Oct 19	15
			A#3: Survey results analysis (2 weeks)	6	Oct 23	30
	Oct 17-18	Fall Break				

Module	Start Date -End Date	Topic	Assignments	Est. Time to Complete (hrs)*	Due Date	Points
Module 9	Oct 24 - Oct 30	Interactive: Facilitation and in-person engagement	A: Scripting and recording an engagement	8	Oct 30	30
			Discussion of engagement recordings	1	Oct 31	15
Module 10	Oct 31 - Nov 6	Interactive: Citizen science and big data	Quiz on Big Data	1	Nov 6	12
			A: Design of a citizen science project	8	Nov 6	30
			Discussion of citizen science project	1	Nov 7	15
Module 11	Nov 7 - Nov 13	Online: Short form Social Media	A#1: Critical analysis of key sites and online posts assignment	4	Nov 13	20
			A#2: Prep of three posts for 3 social media forms	6	Nov 13	30
			Discussion of social media posts	1	Nov 14	15
Module 12	Nov 14 - Nov 27	Online: Long form Electronic Media	A#1: Long form description for website or blog	6	Nov 27	30
			A#2: Prepare video presentation of scientific and technical info	10	Nov 27	30
			Discussion of video	1	Nov 28	15
	Nov 24-25	Thanksgiving Break				
Module 13	Nov 28 - Dec 4	Scientific communication portfolio and Student presentations of project	A#1: Overall portfolio compilation	8	Dec 4	100
			A#2: Summary presentation of portfolio	6	Dec 4	100
Module 14	Dec 5 - Dec 11	Discussion of student presentations	Discussion of portfolio presentation from other students	2	Dec 11	15
			Course Evaluation		Dec 11	0
			Total:			1000

*Includes relevant readings, watching lectures, and completing assignment,