Communicating Science to the Public

FISH 605

Spring, Odd-numbered years

Course information

2 credits (2+0)

Prerequisites: graduate standing in the sciences (advanced undergraduates may take the course with instructor permission)

Schedule: Friday 9-11 am

Location: Juneau and other sites by permission of instructor. The course will be taught from Juneau. Due to the highly interactive nature of this course, it will be distance-delivered only to sites with at least two students enrolled.

Instructor

Dr. Anne Beaudreau

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Skype: anne.beaudreau

Office hours: Friday 11am-1 pm or by appointment

Course readings/materials

There are four required books for this course (*see reading list below*). Additional readings will be made available on Blackboard. Students will need to provide their own laptops, unless they are available for checkout from their home department.

Course description

FISH 605 Communicating Science to the Public

2 Credits Offered Spring Odd-numbered Years

In this course, students will gain practical skills in communicating environmental science to the public and natural resource policy makers. Short lectures, readings, and discussion will focus on communication issues in environmental science and management and best practices for good oral and written communication. Throughout the semester, students will work with peers to develop tools for effective science communication and engage with invited professionals in science journalism, public relations, and resource management. Students will gain direct experience in communicating their own original research to a public audience through a group outreach event that they will co-organize at the culmination of the course. ***Prerequisites: graduate standing in the sciences; or permission of instructor.*** (2+0)

Course goals

As researchers, we are increasingly asked to demonstrate the broader impacts of what we do to funding agencies, other scientists, and the general public. This course will provide a valuable opportunity for students to practice those communication skills before they join the workforce. The central goal of this course is for students to practice communicating their own original research to the public in oral and written form, and to showcase their skills at a public outreach event at the end of the semester. Course activities are designed to meet the following objectives:

(1) *Build the oral, written, and visual communication skills that graduate students will use throughout their careers.* Specifically, students will gain extensive practice in presenting their original research to peer and public audiences. Our focus is predominantly on oral presentation with the use of visual aids (e.g., images, video, data plots, other graphics) and writing for popular media outlets (e.g., blogs, magazine or newspaper articles)

(2) *Increase graduate student skill in communicating environmental science to diverse audiences*. Students will learn to assess the prior knowledge of an audience and tailor their communication to that group. They will learn to use tools such as metaphors and analogies to tell the story of their research.
(3) *Provide experience in facilitating discussions and constructive critiques among peers.* Throughout the semester, students will develop their skills in peer-review through constructive criticism and discussion of each other's work. They will learn to facilitate group discussion of literature on learning and communication.

Student learning outcomes

By the completion of this course, students will be able to:

- Present their own research clearly and effectively, with minimal jargon, in oral and written form for lay audiences.
- Assess the prior knowledge of their audience and, accordingly, translate their research effectively to specific audiences (e.g., fisheries stakeholders, natural resource managers, other scientists, general public).
- Communicate the broader impact of their own research, in particular, being able to clearly and concisely articulate why their research matters. They will practice doing so one-on-one, in small peer groups, and with a large public audience.
- Develop metaphors and analogies to effectively translate science concepts to audiences of all ages and backgrounds.
- Understand the purpose of and create original infographics to help communicate scientific concepts.
- Lead and facilitate discussions among peers and constructive critiques of each other's work.

Reading List

Baron N. 2010. Escape from the Ivory Tower. Washington, DC: Island Press. *Available as UAF e-book at no cost.*

Dean, Cornelia. 2009. Am I Making Myself Clear? A Scientist's Guide to Talking to the Public. Cambridge, MA: Harvard University Press. *Available as UAF e-book at no cost.*

Heath, Chip & Dan Heath. 2007. Made to Stick. New York, NY: Random House. *Available from Amazon for approx. $12 (Kindle) or $7 (paperback).*

Olson, Randy. 2009. Don't be *Such* a Scientist. Washington: Island Press. *Available from Amazon for approx. $10 (Kindle) or $16 (paperback).*

Other readings will be assigned throughout the semester, and will be posted on Blackboard approximately 1 week prior to the due date. See course schedule below for more details.

Instructional methods and evaluation

The course will be taught using a combination of discussion and active learning methods. Discussions will focus on current issues in the presentation of science to the public. Classroom exercises and workshops with professionals engaged in science communication (2-5 over the

course of the semester) will provide students with an opportunity to practice oral and written communication for multiple audiences and purposes. Course materials, including assigned readings, will be provided to students through Blackboard.

Workshops and discussion
Students will practice their communication skills throughout the semester by leading and participating in class discussions and workshops. Each student will lead 1-2 in-class discussions about the assigned readings for the week. Students will also participate in 2-5 workshops led by invited experts in science journalism and science-based decision making in natural resource management. Workshops take place during a regularly scheduled class period and typically include a lecture and classroom activities led by the invited expert. While the workshop speakers may vary from year to year, we will always cover at least 3 specific topics (and possibly more, as opportunity allows). These topics are science journalism, marine science-policy interface, and graphical display of information. The total number of workshops will be determined by the instructor prior to the start of the course based on the availability of local and visiting guests.

Public presentations
Students will develop a presentation about their own research designed for a general public audience. Students will present to their peers, revise their presentations based on feedback, and then present their talks as a science outreach event in a public venue. The students will collaboratively identify potential venues for their final presentations and contact staff there to determine interest in hosting a science outreach event. For example, venues could include a public library, a museum, a government facility, or an educational institution. The outreach event will be conceived and coordinated by the students and instructor, in coordination with relevant staff at the chosen venue. Following the outreach event, students will be asked to self-evaluate their performance and, as a group, discuss the successes and lessons learned from the experience.

News article analysis
Read and present the scientific research behind statements made in a popular news media article (e.g., New York Times) covering a marine science-related issue of your choosing. Assess the accuracy of media portrayal of the science and evaluate the challenges of conveying complicated scientific concepts to a lay audience.

Written communication
Students will write a short article on their own research or a current research topic of their choice for the popular press. Articles will be posted on the instructor's website (http://sites.google.com/site/annebeaudreau).

Point breakdown

Assignment/Exam	**Points**
Final presentation to the public	200
Article for popular press	100
News article analysis	100
Participation	100
Discussion leader	50
TOTAL	**550**

Grades will be calculated as a percentage of the 550 points possible in the course. Rubrics will be distributed that describe specific scoring procedures for each assignment. Students are encouraged to be creative and push themselves out of their comfort zone to ultimately improve their communication skills. Therefore, 50% of the final presentation grade will be based on effort throughout the semester and improvement following peer input. The remaining 50% will be based on oral presentation style, narrative and structure, clarity of ideas, and quality of visuals.

90-100% = A
80-89% = B
70-79% = C
60-69% = D
Below 60 = F

Course policies

My role in this course is to largely serve as a facilitator in your practice of science communication. This includes providing the necessary background on each week's topics, facilitating in-class exercises, and moderating classroom discussions. Your role is to be an active, contributing member of the class.

Attendance and in-class participation are very important in this course. If you cannot attend class for a legitimate reason, it is your responsibility to contact me in advance. With the exception of emergencies, late assignment requests will only be honored if a legitimate reason is provided to me in writing at least one week prior to the due date.

Plagiarism and other forms of academic dishonesty will not be tolerated in this class. Plagiarism is defined as the submission or presentation of work that is not a student's own without acknowledgment of the source. Submission of the same work in more than one course without prior approval of all professors responsible for the courses is also considered academic dishonesty. Any suspected cases of academic misconduct will be handled according to University regulations and violations will result in automatic failure of the course.

You are responsible for understanding and following the UAF Student Code of Conduct (http://www.uaf.edu/catalog/current/academics/regs3.html).

Support services

I encourage you to take advantage of my scheduled office hours or, if necessary, make an appointment to meet with me. I am happy to provide the support you need to be successful in the course. Students with special needs or concerns can contact Student Support Services (474-6844). Please let me know at the beginning of the semester if you will require accommodations due to a documented disability and I will work with you in conjunction with the Office of Disability Services (http://www.uaf.edu/disability/). You can also contact Disability Services by phone (907-474-5655) or e-mail (fydso@uaf.edu).

Course schedule: F 0900-1100
SUBJECT TO REVISION

Week/ Dates	Topic	Assigned reading
1	**Introduction and overview** *Lecture & discussion: Communicating climate science case study* *Activity: Simple communication exercise; Personal science communication stories*	1. Somerville RCJ, Hassol SJ (2011) Communicating the science of climate change. Physics Today, Oct 2011:48-53 2. U.S. Global Change Research Program (2009) Regional climate impacts: Alaska. pp. 139-144 *In* Global climate change impacts in the U.S. Karl TR, Melillo JM, Peterson TC (eds) Cambridge: Cambridge University Press. Available: http://globalchange.gov/usimpacts
2	**Ways of knowing and the culture of science** *Lecture & discussion: Knowledge generation and transmission; The nature and practice of science; Science culture* *Activity: Elevator pitch*	1. Baron N. Escape from the Ivory Tower. Chapters 1 and 2. 2. Medawar, P.B. Is The Scientific Paper a Fraud? Experiment: A Series of Scientific Case Histories First Broadcast in the BBC Third Programme, David Edge, editor. London: British Broadcasting Corporation, 1964, pp. 7-13.
3	**Storytelling and developing a theme** *Lecture & discussion: Elements of a story; Framing your research story* *Activity: Message box*	1. Dean C. Am I Making Myself Clear? Chapters 8 and 9 2. Baron N. Escape From the Ivory Tower. Chapter 4. 3. Heath and Heath. Chapter 6. Stories.
4	**Science translation** *Workshop: Science journalism; Radio* *Activity: Terminology; Analogies and metaphors*	1. Dean C. Am I Making Myself Clear? Chapters 3-6
5	**Knowing your audience** *Lecture & discussion: Assessment of prior knowledge and misconceptions; Building rapport* *Activity: Oral presentation practice session ("so what?")*	1. Olson R. Don't Be Such a Scientist. Chapters 3 and 5. 2. Baron N. Escape from the Ivory Tower. Chapter 4 (*review*).
6	**Communicating science to stakeholders** *Lecture & discussion: Aquatic conservation case study* *Activity: Oral presentation practice session (storyboard I)*	1. Baron N. Escape from the Ivory Tower. Chapter 8. 2. Olson R. Don't Be Such a Scientist. Chapters 1, 2, and 3 (*review*).
7	**Science advocacy** *Lecture & discussion: Advocacy and ethics; Finding your advocacy comfort zone* *Activity: Oral presentation practice session (storyboard II)*	1. Advocacy in Science: Summary of a Workshop convened by the American Association for the Advancement of Science. Washington, DC. October 17-18, 2011
8	**Writing for lay audiences** *Lecture & discussion: Principles of good science writing; News article analyses* *Activity: Writing a lead* *Assignment due: News article analysis*	1. Dean C. Am I Making Myself Clear? Chapter 10 2. Rafter, Michelle. Writing basics: how to write a lead. URL: http://michellerafter.com/2013/02/20/writing-basics-the-lead/ 3. Scanlan, Chip. The Nut Graf, Part I. URL: http://www.poynter.org/how-tos/newsgathering-storytelling/chip-on-your-shoulder/11371/the-nut-graf-part-i/ 4. Tucker, Ian. Science writing: how do you make complex issues accessible and readable? URL: http://www.guardian.co.uk/books/2012/dec/02/science-writing-

		debate-pinker-gleick-greene-frank-foer
9	NO CLASS – SPRING BREAK	
10	**Visual display of information** *Workshop: Graphical display of information—tips and tools* *Activity: Creating infographics; Single slide activity*	1. Yau N (2011) Visualize This, Chapter 1. Wiley Publishing, Inc.: Indianapolis, IN 2. Infographics a. http://www.verysmallarray.com/?p=1538 b. http://www.washingtonpost.com/wp-srv/special/nation/us-weekly-flu-report/?tid=rr_mod c. http://www.informationisbeautiful.net/play/mountains-out-of-molehills/ d. http://www.st.nmfs.noaa.gov/economics/publications/feus/ e. fisheries_economics_2011
11	**Public process of resource management** *Workshop: Marine science-policy interface* *Activity: Oral presentation practice session (analogies & metaphors)*	1. Conway FDL (2006) Sharing knowledge, power, and respect: Keys in bringing communities together to improve science, practice, and relationships. Journal of Higher Education Outreach and Engagement 11(1):133-143 2. Verweij MC, vanDensen WLT, Mol AJP (2010) The tower of Babel: Different perceptions and controversies on change and status of North Sea fish stocks in multi-stakeholder settings. Marine Policy 34:522-533
12	**Science and film** *Lecture & discussion: Differences between film and other science communication approaches; Effective use of video* *Activity: Oral presentation practice session (graphics)*	1. Olson, R. Don't Be Such a Scientist. Appendix 2, pp. 181-185 2. Zimmer, Carl (2010) Communication: Learning to love science films. Nature 468:35-36. URL: http://www.nature.com/nature/journal/v468/n7320/full/468035a.html 3. An Introduction to Science and Wildlife Filmmaking: http://www.untamedscience.com/film
13	**Presentation peer-review**	No required readings
14	**Presentation peer-review** *Assignment due: Article for popular press*	No required readings
15	**Public presentations. Final thoughts and outreach event debrief.**	No required readings