

Communicating Science - STO 601

Meeting times: Wednesdays, 5:30 - 7:30 PM Alaska Time (Final Exam Date and Time TBD)

Meeting place: Online Synchronous

Prerequisites: Graduate standing in the natural, physical, or social sciences.

Credits: 2

Instructor:

Dr. Kristin Timm

Email: kmtimm@alaska.edu

Phone: 907-474-6836

Office location: Akasofu 408E

Office hours: By appointment

Course Description

This highly interactive course allows students to gain hands-on experience designing and practicing science communication for public audiences. Over the course of the semester, students will design three science communication efforts and present their own science to peers. Students will also explore relevant communication theories and current topics.

Course Purpose and Objectives

There is an increasing and well-documented need for science to be effectively communicated with various publics. This course aims to build science communication skills among students pursuing research careers in the natural, physical, or social sciences. Students will learn how to use strategic communication approaches to advance their objectives, engage with specific audiences, and design communication efforts that reach audiences where they are. Insights into human behavior, communication, and social systems will complement the practical, skills based approach of the class. At the conclusion of this class, graduate students will have many of the skills needed to improve communication efforts in their work or in future careers, develop evidence-based communication strategies that complement their research activities, pursue funding for their communication efforts, or to pursue additional training towards careers in communication, education, community engagement, and outreach in the context of health or science.

Student Learning Outcomes

Upon completion of the course, students will:

- Define the roles science communication fills in society and distinguish between multiple ways to engage in science communication work
- Recognize that communication is an audience-centered process and identify multiple methods of understanding a given audience (including listening, research, etc.)
- Explain the potential outcomes of science communication and be able to write SMART (Specific, Measurable, Achievable, Relevant, Time-Bound) objectives to articulate the specific outcomes they want to achieve
- Devise ways to effectively communicate scientific concepts to multiple audiences
- Distinguish between a variety of communication strategies and tactics and feel confident selecting strategies and tactics to meet their objectives

- Evaluate how a variety of psychological and social phenomena affect science communication
- Examine how diversity, equity, inclusion, and other ethical considerations relate to the communication of science
- Design science communication strategies and use evidence to explain or defend why particular strategies were adopted
- Synthesize and present information from a variety of sources to lead a scholarly discussion about a specific science communication topic

Required Reading

All required readings and course materials will be posted on Canvas. However, if you would like to purchase the books that we will be reading selections from this semester, the following books are highly recommended:

- Alda, A. (2017). **If I Understood You, Would I Have This Look on My Face?: My Adventures in the Art and Science of Relating and Communicating.** Random House.
- Gallo, C. (2015). **Talk like TED.** St. Martin's Griffin.
- Hayhoe, K. (2021). **Saving us.** One Signal Publishers.
- Heath, C & Heath, D. (2007). **Made to Stick: Why Some Ideas Survive and Others Die.** Random House.
- Kearns, F. (2021). **Getting to the Heart of Science Communication.** Island Press.
- Reynolds, G. (2019). **Presentation Zen.** New Riders.

Logistics and Technology Requirements

Canvas: All of the course materials will be on Canvas. Students will submit their work via Canvas. Students will be expected to download materials and upload assignments.

Zoom: Classes will be online, synchronous format with a shared meeting time using Zoom. While you are free to choose to keep your camera on or off, I strongly encourage you to use your webcam.

Email: The easiest way to get in touch with me is via email. I will make every effort to respond within 24 hours. In order to ensure that I do not miss your email, please put STO 601 in the subject line and send email from your University of Alaska email account.

Stacked Course

This course is offered for upper-level undergraduate and graduate students. This course is designed to provide students with an introduction to the topic of science communication. The stacked course provides an exceptional opportunity for discussing and practicing science communication, because the diverse audience of our classroom in terms of content area knowledge, interests, and skills, will be representative of what we will likely encounter in our communication efforts outside this classroom. Because we all communicate and have experience doing so in a range of contexts and mediums, all students have valuable knowledge, skills, and experience that can contribute to our shared learning in this class regardless of grade level.

Science or Health Focus Area

Graduate students pursuing a research (i.e. chemistry, biology) or professional degree (i.e. public health, communication) will be expected to identify a sufficiently narrow science or health topic that they are interested in communicating about during the semester (i.e. permafrost thaw in Alaska; nutritional qualities of subsistence foods). Graduate students in the natural, physical, or social sciences will be expected to use their own research area as a basis for their communication projects. By the end of Week 2 of the class, email Dr. Timm with a short description of the topic you have selected.

Assignments and Grading

Science Presentation - Strategy Worksheet (with additional essay) - Peer evaluations	50
Digital/Social Media Plan - Strategy Worksheet (with additional essay)	50
Final Project, Presentation & Proposal - Strategy Worksheet (with additional essay) - Outreach Proposal (for EPSCoR or AGU Sharing Science) - "Pitch" Presentation	150
Participation - Complete assigned readings - Actively participate in discussion and in-class exercises	150
Discussion Leadership - Synthesize, present and lead 30-min of class discussion on a TBD topic	50
TOTAL	450

Grades

Grades will be calculated as a percentage of the 350 (undergraduate) or 450 (graduate) points possible in the course. >90% = A; 80-89% = B; 70-79% = C; 60-69% = D; <60% = F

Assignments:

Detailed instructions for undergraduates and graduates and rubrics will be distributed that describe specific scoring procedures for each assignment.

Science Presentation

You will provide 1 ten-minute presentation to the class about your own science or a science topic you are interested in. The presentation should be given in a style appropriate for a pre-defined audience of non-scientists that is not familiar with the topic/your research. You will also be expected to provide constructive peer evaluations to your classmates.

Digital/Social Media Plan

You will develop a strategy to engage a specific audience using a specific social media platform. The plan will include SMART objectives, audience analysis, key messages, strategies, and prototype content. (Note: If you work with or partner with an existing organization, you might want to use this opportunity to plan a "takeover" campaign.)

Final Project, Presentation, & Proposal

You will develop a strategy to engage a specific audience using a method of your choice. The plan will include SMART objectives, audience analysis, key messages, strategies, and

prototype content. You will “pitch” your plan with a 5-10 minute presentation in the last class (picture convincing your funder or supervisor to adopt this strategy). Students will be expected to translate their strategy into a mini-proposal, providing detailed information about their communication strategies and rationale, which they can use to inform or pursue future funding to support their communication efforts. Examples of funding sources might include (a template(s) will be provided):

- AGU Sharing Science Grants for Science Communication and Outreach
- NSF Broader Impacts
- EPSCoR Education and Outreach Seed Grant Solicitation

Participation

Graduate students will read books, popular writing, and peer-reviewed literature related to science communication. You are expected to complete readings before class and actively participate in the discussion every class session. Our aim is to interrogate the ideas we’ve read, to assess their relevance. To actively participate:

- Identify key ideas in a reading (or on the topic overall);
- Make connections between key ideas;
- Raise questions about or challenge key ideas using evidence;
- Answer another student’s question; and
- Express an informed point of view.

Feel free to embrace, dispute, or modify any idea expressed in the course, but please stay on topic and reference specific readings.

Discussion Leadership

Graduate students will be expected to synthesize the weekly readings, give a short presentation, and facilitate a class discussion on a science communication topic TBD. Sign up for discussion topics and dates will be available at the beginning of the semester.

Attendance Policy

I expect you to attend class and participate. Science education research has demonstrated that students who take an active role in their learning learn more and retain that knowledge longer. In other words, participation will help you get the most out of the course. Your attendance will be part of your participation grade.

Communication is an audience-centered process, and so it is imperative that you have the chance to present to audiences to practice and refine your skills. All scheduled presentations must be given on the day that they are scheduled. However, if you have a documented illness, prior commitment, or emergency that causes you to miss a presentation, please speak with the instructor about alternative means to practice and present your work.

Plagiarism/Academic Honesty: Disciplinary action may be initiated in cases of plagiarism, cheating, and/or academic dishonesty. Please refer to the student code of conduct:

http://www.uaf.edu/catalog/current/academics/regs3.html#Student_Rights

COVID-19 statement: Students should keep up-to-date on the university’s policies, practices, and mandates related to COVID-19 by regularly checking this website:

<https://sites.google.com/alaska.edu/coronavirus/uaf?authuser=0>

Further, students are expected to adhere to the university’s policies, practices, and mandates and are subject to disciplinary actions if they do not comply.

Student protections statement: UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX). Faculty members are designated as responsible employees which means they are required to report sexual misconduct. Graduate teaching assistants do not share the same reporting obligations. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site:

<https://catalog.uaf.edu/academics-regulations/students-rights-responsibilities/>.

Disability services statement: I will work with the Office of Disability Services to provide reasonable accommodation to students with disabilities.

Student Academic Support:

- Speaking Center (907-474-5470, uaf-speakingcenter@alaska.edu, Gruening 507)
- Writing Center (907-474-5314, uaf-writing-center@alaska.edu, Gruening 8th floor)
- UAF Math Services, uafmathstatlab@gmail.com, Chapman Building (for math fee paying students only)
- Developmental Math Lab, Gruening 406
- The Debbie Moses Learning Center at CTC (907-455-2860, 604 Barnette St, Room 120, <https://www.ctc.uaf.edu/student-services/student-success-center/>)
- For more information and resources, please see the Academic Advising Resource List (https://www.uaf.edu/advising/lr/SKM_364e19011717281.pdf)

Student Resources:

- Disability Services (907-474-5655, uaf-disability-services@alaska.edu, Whitaker 208)
- Student Health & Counseling [**6 free counseling sessions**] (907-474-7043, <https://www.uaf.edu/chc/appointments.php>, Whitaker 203)
- Center for Student Rights and Responsibilities (907-474-7317, uaf-studentrights@alaska.edu, Eielson 110)
- Associated Students of the University of Alaska Fairbanks (ASUAF) or ASUAF Student Government (907-474-7355, asuaf.office@alaska.edu, Wood Center 119)

Nondiscrimination statement: The University of Alaska is an affirmative action/equal opportunity employer and educational institution. The University of Alaska does not discriminate on the basis of race, religion, color, national origin, citizenship, age, sex, physical or mental disability, status as a protected veteran, marital status, changes in marital status, pregnancy, childbirth or related medical conditions, parenthood, sexual orientation, gender identity, political affiliation or belief, genetic information, or other legally protected status. The University's commitment to nondiscrimination, including against sex discrimination, applies to students, employees, and applicants for admission and employment. Contact information, applicable laws, and complaint procedures are included on UA's statement of nondiscrimination available at www.alaska.edu/nondiscrimination. For more information, contact:

UAF Department of Equity and Compliance
1692 Tok Lane, 3rd floor, Constitution Hall, Fairbanks, AK 99775
907-474-7300
uaf-deo@alaska.edu

Course schedule (subject to change)

<u>Date</u>	<u>Topic</u>	<u>Assignments</u>
Week 1	Introduction to the Course and Science Communication	
Week 2	Science in Society <ul style="list-style-type: none"> - The Honest Broker, Chapter 1 - Getting to the Heart of Science Communication, Chapter 1 - Trust in Science is not the Problem - Want to do better science? Admit you're not objective - Trust and Mistrust in Americans' Views of Scientific Experts 	
Week 3	Inclusive Science Communication Guest speaker: TBD <ul style="list-style-type: none"> - An Inclusive Science Communication History E-book - Getting to the Heart of Science Communication, Chapter 8 - Forging Equitable Scientist-Community Partnerships for Citizen Science Projects, S. Crawford & J. James - Developing Best Practices for Working in Arctic Communities, D. Peters - The State of Inclusive Science Communication: A Landscape Study 	Email Dr. Timm with a 2-3 sentence description of your science topic for the semester.
Week 4	Understanding Audiences <ul style="list-style-type: none"> - If I Understood You... Chapter 2 & 3 - Saving Us, Chapter 2 - Roser-Renouf et al (2014) Engaging diverse audiences with climate change: Message strategies for Global Warming's Six Americas - Leizerowitz et al. (2021). Global Warming's Six Americas: A review and recommendations for future climate change communication. 	

Week 5	<p>Presenting Science & Visual Communication</p> <ul style="list-style-type: none"> - Talk Like TED, Chapter 2 - Presentation Zen, Chapter TBD - Enough With The Climate Jargon: Scientists Aim For Clearer Messages On Global Warming - Nisbet (2009) Communicating climate change: Why frames matter for public engagement. Environment. - Wolsko et al (2016) Red, white and blue enough to be green. 	
Week 6	<p>Objectives for Science Communication</p> <ul style="list-style-type: none"> - Atkin & Rice (2012) Theory and principles of public communication campaigns - SMART Objectives - Thinking about Your Communication Goals and Objectives: An Interview with John Besley and Anthony Dudo - Dudo & Besley. (2016). Scientists' Prioritization of Communication Objectives for Public Engagement 	
Week 7	<p>Digital Science Communication Guest speaker: TBD Social Media Expert</p> <ul style="list-style-type: none"> - TBD - Milkman & Berger (2014) The science of sharing and the sharing of science. - Valente (2012) Network interventions. Science. 	
Week 8	<p>In-Class Presentations</p> <ul style="list-style-type: none"> - Review the presentation rubric before class 	Science Presentation & Strategy Due
Spring Break 9 March	Spring Break - No Class	
Week 9	<p>Creating Sticky Messages & Talking to the Media Guest speaker: TBD Media Communication</p> <ul style="list-style-type: none"> - Made to Stick, Chapter TBD - COMPASS Message Box 	

	<ul style="list-style-type: none"> - Ratner & Riis (2014) Communicating science-based recommendations with memorable and actionable guidelines. 	
Week 10	<p>Selecting Strategies and Tactics</p> <ul style="list-style-type: none"> - If I Understood You..., Chapter 9 - Reading about tactics, TBD - Affordances paper TBD - Information processing paper TBD 	
Week 11	<p>Tricky Issues in Science Communication: Controversy, Misinformation & Politicization</p> <ul style="list-style-type: none"> - Getting to the Heart of Science Communication, Chapter 6 - What Conversations with Voters Taught Me about Science Communication, K. Kirk - How to Talk to Friends and Family Who Share Conspiracy Theories, C. Warzel - Why It's Important to Push Back on 'Plandemic'—and How to Do It, T. Haelle - Cook et al. (2017). Neutralizing misinformation through inoculation: Exposing misleading argumentation techniques reduces their influence. 	Digital/Social Media Plan Due
Week 12	<p>Risk, Crisis, and Uncertainty Communication</p> <ul style="list-style-type: none"> - Pidgeon, N. & Fischhoff, B. (2011). The role of Social and Decision Sciences in Communicating Uncertain Climate Risks. - The Honest Broker, Chapter TBD - A Review of the Effects of Uncertainty in Public Science Communication, (2020) Gustafson, A. - Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. <i>Health Education & Behavior</i>, 27(5), 591-615. 	
Week 13	<p>Emotion & Science Communication</p> <ul style="list-style-type: none"> - Getting to the Heart of Science Communication, Chapter 7 	

	<ul style="list-style-type: none"> - If I Understood You..., Chapter 9 - Why facing our feelings is essential for tackling our climate crisis, R. Lertzman 	
Week 14	<p>Future Directions in Science Communication</p> <ul style="list-style-type: none"> - Getting to the Heart of Science Communication, Chapters 9 & 10 - What Institutions Can do to Improve Science Communication, J. Eise - Wong-Parodi, G. & Strauss, B. H. (2014). Team Science for Science Communication. - Kania & Kramer (2011). Collective Impact. - Besley, J. (2020). Five Thoughts About Improving Science Communication as an Organizational Activity. 	
Week 15 Final Exam Period	Final Project "Pitch" Day	Final Project and In-Class Presentation Due